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## Worldwide Report

# TELECOMMUNICATIONS POLICY, RESEARCH, AND DEVELOPMENT

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18 JULY 1986

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TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

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18 July 1986

HONG KONG

## EFFICIENT TELEPHONE SERVICE EXPECTED TO CONTINUE

Hong Kong SUNDAY STANDARD in English 1 Jun 86 p 2

[Text]

HONGKONG's telecommunications system will remain efficient, competitive and relatively low-cost well into the 1990s, according to Mr Wong Sik-kei, Chief Telecommunications Engineer.

Mr Wong was speaking at a seminar organised by the Chinese University of Hongkong Graduates School Alumni Association at the Hilton Hotel yesterday.

He said the deregulated monopolistic environment in which Hongkong's telecommunications industry is developing, coupled with Hongkong's compactness in size, would ensure a cheap and efficient basic service in the future.

He said there is a global trend towards a more liberalised and relaxed framework in telecommunications regulation to allow competition to provide more services to suit the operational needs in the commercial sector.

"Such new services will be in the "non-voice" category as more and more data-communication and computers are being used in the commercial sector.

"Deregulation of enhanced and value-added services can also lead to the availability of a wide variety of flexible and economical services," he said.

Mr Wong noted that home telephone users too have seen the efficiency of the telephone service improve enormously over the last decade.

"Ten years ago it was not an easy task to have a telephone installed and the quality of service was often less than adequate," he said.

"Now, in contrast, anyone can have a telephone installed within days and there is a whole range of designs to choose from offering all kinds of gimmicks."

He also said ordinary people had benefited from the controlled deregulation of the telecommunications industry.

"Deregulation has stimulated the growth of a variety of enhanced and value-added services and has made pricing more competitive."

As an example he cited the public mobile radiotelephone service. The message charge has fallen from two dollars to one dollar per minute in just one year and the price of renting a set has fallen from \$15,000 to \$7,000 over the same period of time.

"The lowering in price will attract more users which will in turn stimulate the growth of such services," he added.

/9317

CSO: 5550/0130

MALAYSIA

BRIEFS

ERICSSON MOBILE PHONE CONTRACT--Ericsson has received an order from Malaysia to expand that country's previously installed mobile telephone system. The order is worth 33 million. The so-called Atur system, Automatic Telephone Using Radio, began operating in January 1985. The system now has 7,000 subscribers. This figure is increasing by about 600 per month, according to Ericsson. A so-called small-cell system is now being constructed in the capital city of Kuala-Lumpur in order to increase the capacity from 3,500 to 11,000 subscribers. [Text] [Stockholm DAGENS NYHETER in Swedish 29 May 86 p 10] 9336

CSO: 5500/2681

PEOPLE'S REPUBLIC OF CHINA

OPEN DOOR ACHIEVEMENTS IN POSTS AND TELECOMMUNICATIONS

Beijing GUOJI SHANGBAO in Chinese 9 Sep 85 p 1

[Article by own correspondent Wang Chang [3769 1603]: "With Daily Improvement of Infrastructure and Continuous Adoption of Advanced Equipment, China's International Postal and Telecommunications Services Are Developing Rapidly"]

[Text] Since opening up to the outside world, China has made great progress improving its international postal and telecommunications services; infrastructure has been perfected constantly, and the volume of business has been increasing continuously.

With regard to international postal service, China has established direct postal service with 113 countries, and separate pieces of mail can be indirectly forwarded to every country or region of the world. Because certain units need to mail important documents, data or valuable goods, China has established insured letter and parcel post service with almost 100 countries and territories.

In order to shrink the time between airline flights and the amount of time it takes to process mail, and speed up mail delivery, China in 1980 instituted an international express mail service, which was highly welcomed by its patrons. The service is now in operation with 30 countries and territories, such as Japan, the United States, Canada, Great Britain, France, the FRG, the Netherlands, Australia, Singapore and Hong Kong. Incoming and outgoing mail amounts to 160,000 pieces annually.

Electronic mail is an advanced form of communication, available now in only 20-odd countries of the world. In China, preparations for the use of electronic mail are basically complete, and this service will begin in October this year,.

With regard to international telecommunications, China's infrastructure has been greatly improved. China now has four satellite earth stations. Shanghai operates a Pacific Ocean earth station, Beijing operates a Pacific earth station and two earth stations for the Indian Ocean. The submarine cable that existed in the past between China and Japan will be restored by 1986. Guangzhou and Hong Kong are connected by a land cable as well as by a microwave system. The international export bureaus of Beijing and Shanghai

have installed programmable telex exchanges with 2,000 and 1,000 lines, respectively. Programmable international telephone exchanges and automatic telegram relay equipment will be installed and available for use within this year. By installing the above-mentioned equipment China has established direct communication circuits with 46 countries and territories.

At present China has instituted such international telecommunication services as telephone, telex, public telegraph, phototelegram, public express facsimile phototelegram, subscriber phototelegram, and data search services. Among these services, telephone services have increased at an annual rate of 52 percent in recent years, and it is estimated that the annual increases during the coming years will be at the rate of 3 percent. China now has direct telephone links with 30 countries and territories, through 761 circuits. With certain countries and territories with large volumes of operations these services are semiautomatic, using the CCITT No 5 signal system. In recent years the volume of international telex service increased at the rate of 40 percent, with the number of users having increased to 2,100 and the international circuits having been increased to 600. All international telex services throughout the country have automatic exchanges.

Since 1982 China has instituted public phototelegraphic and facsimile telegraphic services with Japan, Singapore and Hong Kong, a service that has increased by leaps and bounds. Not only will new connections be established for this service in Asia during this year and next year, but it will be also extended to Europe and North American.

Furthermore, China has employed far-end concentrator instruments in 1983 to link up, through the Italian data exchange network, for information retrieval services, and is now connected with the American TYMNE and TELENET data networks. Similar connections are expected to be established within a year or two with certain other countries.

9808  
CSO; 4006/380

TAIWAN

READER'S LETTER REVEALS TAIWAN-PRC PHONE LINK

Hong Kong SOUTH CHINA MORNING POST in English 31 May 86 p 16

[Article by Ophelia Suen]

[Text]

IT is possible to place an international telephone call from mainland China to Taiwan, in spite of the Taipei Government's staunch "no contact, no communication and no compromise" policy towards the People's Republic.

But it has to be done discreetly.

The *SCM Post* discovered recently that residents and businessmen in the Xiamen special economic zone have been quietly using international direct dialling (IDD) facilities to communicate with their friends and relatives across the Taiwan Strait.

And the fact that Taiwan has apparently turned a blind eye to the increasing number of long-distance calls originated from China has encouraged the trend.

On paper, anyone caught violating Taipei's "three no's" policy faces possible treason charges and the firing squad.

But the *SCM Post*, while covering the defecting China Airlines pilot story, succeeded in making a long-distance call from Xiamen in Fujian province to Taipei, where two of our reporters were stationed.

This is proof that direct communications between the two republics are possible, despite the repeated denials of Taiwan officials that there are any IDD links.

The *SCM Post* made its call at around 10.30 pm (11.30 pm Hongkong time) on May 19, to a colleague who was staying at the Sande Hotel in Taipei.

(The fact of the call was not disclosed at the time because of political sensitivity while the delicate negotiations for the return of the CAL cargo plane were in progress.)

Connected within 15 minutes, the line was loud and clear, without any trace of disturbance or interruption.

The Xiamen hotel operator did not reveal to her counterpart in Taipei where the call

originated, nor was she asked.

Instead of dialling direct from a hotel room, the call had to be connected via the "long-distance calls" counter at the hotel.

Calls to Hongkong and other parts of the world through IDD can be made conveniently by dialling the area code and so on from the hotel room. But the IDD brochures placed in the hotel rooms give no area code for Taiwan.

According to the operator, the line uses telecommunications facilities from Shanghai, hence the necessity to make calls through the "long-distance" counter.

I was told by staff at the Jinbao Hotel in Xiamen where I booked the call that its guests put through up to 20 calls a month to Taiwan.

The following conversation between two operators was overheard.

The Chinese operator said that this was a long-distance call, deliberately omitting that it was from Xiamen on the mainland.

"One moment please," answered the Taiwanese operator, without asking the origin of the call.

During the subsequent four-minute conversation, everything appeared normal.

The ordinary man in the street in Xiamen can also call Taiwan by using the services of the telegraph offices.

China is currently keenly advocating reunification with Taiwan, and has made no secret of the fact.

Taiwan, on the other hand, remains firmly opposed to any dialogue with the mainland, despite claims by Chinese officials that up to 10,000 Taiwanese visited Fujian province last year.

At present, plans are in train to introduce direct telephone dialling system in seven major cities, including Xiamen.

The other six cities are Beijing, Shanghai, Guangzhou, Tianjin, Fuzhou and Qinhuaogdao.

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CSO: 5550/0129

CANADA

# TELECOMMUNICATIONS PROFITS OF MAJOR PUBLIC FIRMS EXAMINED

Toronto THE GLOBE AND MAIL in English 9 Jun 86 p B8

[Article by Lawrence Surtees]

[Text]

MIXED RESULTS AMONG PHONE COMPANIES						
	1st Qtr. revenue			1st Qtr. profit		
	1986	1985	% chg.	1986	1985	% chg.
<b>UTILITIES</b>						
BCE	3,190	2,990	+ 6.68	240.1	255.4	- 5.99
BC TEL	352.8	309.4	+ 13.84	28.7	13.8	+ 107.9
BRUNCOR	62.6	58.3	+ 7.37	5.9	5.6	+ 5.35
MARITIME TEL	80.6	72.8	+ 10.71	5.7	6.4	- 10.93
HEWTel	36.2	32.5	+ 11.38	4.3	4.4	- 2.27
ISLAND TEL	8.3	7.8	+ 6.41	1.2	1.0	+ 20.0
QUEBEC-TEL	44.18	42.0	+ 5.19	5.7	5.4	+ 5.5
<b>MANUFACTURERS</b>						
NORTHERN TELECOM*	969.6	978.4	- 0.89	50.1	61.1	- 18.0
MITEL†	110.3	107.5	+ 2.6	(58.2)	0.06	n/a
TIE/TELECOM	23.5	25.3	- 7.11	0.58	1.2	- 51.6

\* In U.S. dollars † For fourth quarter ended March 28, 1986.

An economic slowdown in the first quarter was reflected, and fueled in part, by profit drops at some of Canada's largest publicly traded telecommunications companies, including telephone utilities, equipment makers and distributors.

Signs that the post-recessionary boom in telephone company profits was ending, however, became evident in some of the fourth-quarter results.

Companies in the sector that reported reduced profits in the first quarter of this year include blue chip giants Bell Canada Enterprises Inc. of Montreal and Northern Telecom Ltd. of Mississauga, Ont.

Also reporting declines were:

Maritime Telegraph and Telephone Co. Ltd. of Halifax, Newtel Enterprises Ltd. of St. John's and TIE/Telecommunications Canada Ltd. of Markham, Ont.

Bruncor Inc. of Saint John had reduced share profit, while Mitel Corp. of Kanata, Ont., reported a record loss for the year ended March 28. Telesat Canada, the sole domestic communications satellite operator, recently reported reduced revenue and profit for 1985.

"The current financial performance of the telephone utilities can best be described as sluggish," said Douglas Cunningham, utilities analyst with Burns Fry Ltd. of Toronto.

Regulatory decisions setting

lower allowed rates of return on average common equity for the utilities is the contributing factor to slow profit growth, Mr. Cunningham said.

Manufacturers, on the other hand, are facing intense competition and fierce price cutting that has cut into profits.

Most of these companies have forecast reduced share profit for 1986 because of the slump.

Because of its utility, energy and manufacturing interests, BCE's profit has fallen for all those reasons.

Although it is Canada's most profitable corporation, BCE said it will seek potential acquisitions this year to overcome the downturn. BCE's first-quarter profit fell to \$240.1-million from \$255.4-million a year earlier despite an increase in revenue to \$3.2-billion from \$2.9-billion. Share profit was 93 cents, down from \$1.04.

Bell Canada contributed 66 cents to BCE's share profit, compared with 70 cents; Northern Telecom contributed 12 cents, compared with 17 cents; and Transcanada Pipelines Ltd. of Calgary kicked in 7 cents, compared with 11 cents.

BCE chairman A. Jean de Grandpré has not given a precise estimate of BCE's 1986 share profit. He said earlier this year that there will be growth, although less than the 12.8 per cent increase in 1985 profit.

Mr. Cunningham estimates that BCE's share profit will fall to \$3.84

this year from \$4.23 in 1985 and drop to \$3.74 in 1987.

In general, Mr. Cunningham expects utility stocks to underperform the rest of the market. BCE's stock price should hover between \$36 and \$40, he said. And he forecasts that BCE's dividend growth will be 2 to 3 per cent, compared with the utilities' estimated average annual increase of 5 to 6 per cent.

Fewer orders in the U.S. market and the cost of solving technical problems in the first quarter led to Northern Telecom reporting a profit drop to \$50.1-million (U.S.) from \$61.1-million a year earlier. Revenue was \$969.6-million, down from \$978.4-million. Share profit fell to 37 cents from 48 cents.

The effect of a 4 per cent decline in sales of switches to U.S. telephone companies will carry over to the second quarter. Northern Telecom chairman Edmund Fitzgerald forecasts that 1986 revenue will increase by only 5 per cent and profit will rise only slightly more than 5 per cent.

British Columbia Telephone Co. of Burnaby, B.C., is the one exception and is on its way to an excellent year because it has turned around its manufacturing arm, cut costs and benefited from growth in the provincial economy — the last to come out of the 1982 recession.

B.C. Tel's first-quarter profit more than doubled to \$28.7-million from \$13.8-million a year earlier on revenue of \$352.8-million, up from \$309.9-million. Share profit was 54 cents, compared with 20 cents.

Increased growth in the subscriber base and greater long-distance telephone use led to a substantial increase in utility revenue, to \$312.9-million from \$283.8-million.

And B.C. Tel is set for higher

growth because of the turnaround of Microtel Ltd., its manufacturing arm, which had a first-quarter profit of \$2.7-million, compared with a loss of \$13.9-million. Revenue increased to \$39.9-million from \$26.1-million.

Bruncor, the reorganized holding company that owns New Brunswick Telephone Co. Ltd., will have little growth in 1986 because of a regulatory decision cutting back N.B. Tel's allowed rate of return on average equity. Bruncor has diversified into several other ventures, but profit will not be affected until 1987.

Mr. Cunningham forecasts a modest rise in Bruncor share profit in 1986, to \$1.65 from \$1.62. Although Bruncor's first-quarter profit rose to \$5.9-million from \$5.6-million a year earlier, share profit fell to 32 cents from 36 cents because of an increase in the average number of common shares outstanding.

Maritime Tel reported a first-quarter profit drop to \$5.7-million from \$6.4-million. Share profit was 26 cents, compared with 31 cents. However, an extraordinary gain from the carryforward of a loss at its computer subsidiary made the final profit \$7.2-million and share profit 33 cents.

Newtel Enterprises, owner of Newfoundland Telephone Co. Ltd., attributed its profit decline to higher expenses and higher municipal taxes. Profit was \$4.4-million on revenue of \$36.2-million, compared with \$4.3-million on revenue of \$32.5-million.

Further growth for manufacturers will probably come only from new markets and new products. For utilities, it will come from cutting expenses and from rate relief at the expense of subscribers.

/9274

CSO: 5520/86

CANADA

# TAT-9 TRANSATLANTIC FIBER OPTIC SUBMARINE CABLE PLANNED

Toronto THE GLOBE AND MAIL in English 10 Jun 86 p B10

[Article by Lawrence Surtees]

[Text]

A consortium of five international telecommunications carriers, including Teleglobe Canada, plans to build a second fibre-optic submarine cable spanning the Atlantic Ocean.

The \$500-million cable system, dubbed Tat-9, will link Canada, the United States, Britain, Spain and France. Unlike the Tat-8 transatlantic cable, Tat-9 will have a landing point in Canada.

The Tat-8 cable — the first fibre-optic link in the Atlantic — is scheduled to be operational in June, 1988. British Telecommunications International, a unit of British Telecom PLC, has obtained commitments valued at more than \$4-million from customers.

The Tat-9 cable will go into operation in 1991 and will have twice the capacity of Tat-8, said Martin Fournier, vice-president of engineering at Teleglobe. Teleglobe provides communications between Canada and other countries, excluding the United States.

The new fibre-optic lines will replace older copper cables. Teleglobe will retire its Cantat-2 cable, which runs between Canada and Britain, when the Tat-9 becomes operational, Mr. Fournier said.

"Tat-9 will provide high-speed, digital communication lines between countries in the North Atlantic and is needed to accommodate increasing demand that cannot be met by Tat-8."

The five carriers will split the cost of the project. Each member's share will be based on usage. One-third of the 16,000 circuits will be reserved for European telecom administrations that in future may also use the cable.

The capacity of each circuit will be rated at a transmission speed of 64 kilobits a second, but special multiplexing techniques will allow it to carry five times that amount of data.

Fibre-optic cable, made of hair-thin strands of glass, uses laser light to transmit voice and data signals. Fibre optics can carry

more information at greater speeds than a similar-sized copper wire.

The Tat-8 and Tat-9 cables will figure prominently in the worldwide move toward a single telecommunication standard called integrated digital services network (ISDN), Mr. Fournier said.

As telephone companies around the world embrace ISDN, international carriers will also have to build links that conform to the new specifications.

Requests for bids to build the Tat-9 cable will be issued in late 1987. The requests for proposals will only be issued to manufacturers in the North Atlantic region. The bulk of the value of the contract will go to cable makers in either Britain, France or the United States.

"But Teleglobe is committed to seeking support for Canadian companies qualified to make other components required for the project," Mr. Fournier said.

The consortium plans several studies in the next year to determine cable placement and precise landing points.

/9274

CSO: 5520/85



CANADA

BELL CANADA EXAMINATION BY CRTC, SAUDI CONTRACT REPORTED

CRTC Hearing on Bell

Toronto THE GLOBE AND MAIL in English 3 Jun '86 p B7

[Article by Lawrence Surtees]

[Text]

Bell Canada's federal regulator has begun what is expected to be a lengthy and controversial hearing to examine the utility's economic performance.

The prime objective of the proceeding, ordered by the Canadian Radio-Television and Telecommunications Commission last December, is to review how much money Bell will need in the next two years and how much it will cost to raise additional capital. The hearing, which began yesterday, covers a three-year period by including 1985 requirements.

The CRTC regulates Bell's income and revenue requirements by setting an allowed rate of return on average common equity. Return on equity represents the amount of profit accruing to shareholders and is calculated by dividing after-tax profit by the average total shareholder equity.

The range set by the CRTC, in turn, is used to determine subscriber telephone rates. Following the current hearing, the CRTC may decide to raise or lower the permitted range of Bell's return on equity.

The inquiry was prompted, in part, by pressure from consumer groups following Bell's withdrawal last November of its request for a general rate increase. For its part, the CRTC wanted to re-examine Bell's financial status because it has not altered Bell's return on equity since the 1981 rate hearing.

Bell is currently not permitted to earn a return on common equity greater than 14.75 per cent.

However, the CRTC has also angered Bell and the utility's parent company, Bell Canada Enterprises Inc. of Montreal, by using the occasion to look into other aspects of Bell's corporate affairs. Both the CRTC and other interested parties, such as the Consumers Association of Canada, want to determine the financial impact of the corporate reorganization that created BCE in April, 1983.

Bell is the largest subsidiary of BCE and provides telephone service to more than six million customers in Ontario, Quebec and parts of the Northwest Territories. BCE was Canada's most profitable company in 1985 and had profit of more than \$1-billion on revenue of \$13.2-billion, compared with profit of \$940.3-million on revenue of \$10.6-billion a year earlier.

The utility alone had revenue of more than \$5.7-billion in 1985 and contributed profit of \$652.1-million to BCE's bottom line, compared with revenue of \$5.3-billion and profit of \$626.7-million a year earlier.

Bell's subscribers will also be affected by the CRTC's final decision on whether the company can have a 2 per cent rate increase. It was temporarily granted in January, 1985, but subsequently rescinded because of improving financial conditions.

Successful efforts at cutting expenses, coupled with a low inflation rate and declining interest rates, have led Bell to ask the CRTC to peg its return on equity range at between 13.75 to 14.25 per cent. Bell's operating expenses increased 7.3 per cent last year to \$3.9-billion from \$3.7-billion in 1984.

To stay within a lower return on equity range, Bell promises to curb further the annual rise in expenses to a 4.8 per cent increase in 1986, or \$4.1-billion, and 6.3 per cent in 1987, or \$4.4-billion. Bell also forecasts revenue of \$5.8-billion in 1986 and \$6.1-billion in 1987.

But Bell estimates it will need to raise \$1.25-billion in debt and equity capital during 1986-87 to meet increased subscriber demand, to undertake its current capital construction program and to repay long-term debt.

Bell forecasts its annual financing requirements will be higher in the period, as will its need for common equity infusions. Bell raised \$525-million in 1985 and expects to raise \$575-million in 1986 and \$679-million in 1987. BCE will continue to be the source of most common equity, but the core financing vehicle will be long-term debt.

In support of its request, Bell has filed several reports from domestic and U.S. financial analysts stating that the requested return on equity range is required to support Bell's double-A credit rating.

The company further states it needs to support that credit rating because of an increased need to raise capital on international markets.

In addition to debating Bell's analysis and forecasts, hearing participants are expected to get involved in several other areas of Bell's business.

Although the CRTC has the power to demand information from Bell regarding regulated activities and the utility's balance sheet, it has no legal power to obtain documents from BCE or other subsidiaries in its empire that might have dealings with Bell. Legislation that would give the CRTC broader powers to obtain information from BCE related to Bell is still before Parliament.

The difficulties in obtaining information from Bell in the current proceeding have al-

ready demonstrated to CRTC staff and outside interests the need for those powers. The legal sparring between Bell lawyers and the CRTC over answers to written questions has led to acrimony and numerous complaints.

John Lawrence, CRTC vice-chairman, outlined his complaints last Friday at the close of the pre-hearing conference in what amounted to a public indictment of Bell's responses to questions about its international activities. Mr. Lawrence said Bell's response would not help the CRTC make its decision and ordered the information to be provided. He also refused a request from Bell to keep secret other information concerning local and long-distance rates.

The complaint arose when Bell balked at providing information about the second five year-contract, worth \$1.5-billion, between Bell Canada International Inc. of Ottawa and the Government of Saudi Arabia. Consumer groups requested details to determine whether monopoly telephone subscribers are subsidizing Bell's work in Saudi Arabia.

## Bid for Saudi Contract

Toronto THE GLOBE AND MAIL in English 5 Jun 86 p B17

[Article by Lawrence Surtees]

[Text]

Bell Canada International Inc. is preparing a bid for a third contract with the Saudi Arabian Government.

The international contract arm of Montreal-based Bell Canada Enterprises Inc. is eager for further business in Saudi Arabia because it will complete its second five-year contract there in December, 1987. The current contract is worth \$1.4-billion (U.S.).

BCI obtained its first five-year contract with the kingdom in January, 1978, when it was a unit of Bell Canada (now the utility arm of BCE). It won the contract to supervise the construction of Saudi Arabia's telephone system as part of a three-member international consortium.

A BCI spokesman confirmed that company officials are currently preparing bid documents for follow-up business. Bell Canada revealed last month that an extension of the present contract is being considered.

Bell's role with BCI and the Saudi contract is currently being examined at a Canadian Radio-Television and Telecommunications Commission hearing dealing with Bell's

economic performance. Several parties in the hearings have been thwarted in their efforts to obtain more information from Bell because of rigid secrecy provisions in BCI's contract with Saudi Arabia.

BCI's role has been to manage the entire construction and operation of the Saudi telephone system. It provides consulting services by employing managers and engineers from Bell on temporary contracts.

"Obviously, our expectations are not for the same magnitude of business after the current contract ends," the BCI spokesman said.

BCI does not know how much business it might be able to get or whether it will be able to gain another contract before the current one ends. The current contract was negotiated six months after the first five-year contract ended and took more than two years to negotiate.

BCI's role has changed over the duration of the contracts. Currently, it mainly supervises and trains Saudi managers. During the first contract, it actually managed the system and the international contractors involved in building it.

"Our role has been evolving with

the development of the Saudi telecommunications system and now involves training people how to use new technologies and advising the Saudis on network planning."

The largest contract of its kind in the world, the Saudi contract involved the construction of an entire telephone system, including modern computer data networks, fibre-optic transmission cables and cellular radio-telephone service.

BCI does not yet know how much more business it may get from the Saudi Arabian Government. Drastic reductions in the world price of oil have led to serious revenue declines in the kingdom and forced it to re-examine all of its development contracts.

However, the BCI spokesman said the Saudis have invested great amounts in the telephone system and will likely require additional consulting services along the lines that BCI is currently providing.

BCI may also face competition for future work there from other domestic telephone companies anxious to expand into international consulting, in addition to competitive bids from competitors offshore.

CANADA

## EVIDENCE OF FRAUD BY CRTC CHAIRMAN BUREAU UNDER REVIEW

Ottawa THE CITIZEN in English 5 Jun 86 p A4

[Text]

Investigators for the RCMP have begun a preliminary review of evidence to determine whether a full investigation is warranted into allegations that the chairman of the federal communications regulator participated in a fraud.

Avrum Cohen, general counsel for the Canadian Radio-television and Telecommunications Commission, confirmed in an interview Wednesday that RCMP officers have visited the CRTC's offices in Hull to interview CRTC officials.

"We have seen the RCMP, but I'm told the stage they're at is to review and see if a full investigation is warranted," Cohen said.

The lawyer said he had no idea if any further steps would be taken, and he declined to discuss other aspects of the case while it is under study by authorities.

The investigation was ordered by Justice Minister John Crosbie after New Democrat MP Lynn McDonald raised the issue in the Commons recently, alleging a possible conspiracy to commit fraud, a misleading of the CRTC, a conflict of interest, and an overcharging of cable television subscribers in dozens of Saskatchewan communities.

McDonald based her allegations on documents she received anonymously, in which Charles Day, a

cable operator from North Battleford, Sask., complained that kickbacks were involved in a deal between a consortium of cable companies in that province and Canadian Satellite Communications Inc. (Cancom).

She said Andre Bureau, then president of Cancom and now chairman of the CRTC, had signed a deal with Saskcable Services Inc. that contained a clause detailing discounts to the consortium. A letter from a Cancom officer to one of the cable companies implied the discounts were to be kept secret from the CRTC.

Bureau has denied any wrongdoing and has said he and the CRTC will co-operate in any investigation.

The first application to bring Cancom service to Saskatchewan was rejected by the CRTC in No-

vember 1983; just days before Bureau became chairman. A subsequent application, which apparently did not contain discounts to the operators from Cancom;

was approved Oct. 23, 1984, 11 months after Bureau took over at

the CRTC.

The original deal would have had customers paying an additional 19 cents a month per channel for a selection of four U.S. commercial and public networks broadcast from Detroit. A portion of that amount, about 3.3 cents, would have been returned to the cable stations by Cancom for advertising and promotion, "or other purpose as the (cable operator) deems appropriate and useful."

But the deal eventually approved by the CRTC increased subscriber fees by only 16 cents a month. The reduction apparently relates to the dropping of the discount.

Industry officials say some form of discounting is a common practice among pay television companies. But they say any discounts — whether a direct return of part of the cost or through several months' forgiveness of the fees — must be declared to the CRTC at the time of the application.

Bureau, a lawyer and former media executive, has in the past admitted that he has sat in on meetings of the CRTC that related to applications from Cancom. But he denies there is any conflict.

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CSO: 5520/85

CANADA

# CONTINUING WORK ON THREE LARGE SPACE PROJECTS REPORTED

Toronto THE TORONTO STAR in English 10 Jun 86 p A10

[Text]

OTTAWA (CP) — Canadian space officials are maintaining a stiff upper lip in the face of yesterday's damning report on the U.S. shuttle disaster, saying they expect an ambitious space program to resume soon with an important role for Canada.

Steve MacLean, the next Canadian scheduled to fly on the shuttle, told reporters he is confident in U.S. space technology and not worried about going up when the shuttle returns to service.

"With any accident, you're going to learn something. . . . With this accident, we have learned some things that people didn't know before, and I think . . . that system on the next flight will be far safer than it was on the previous flight," MacLean said.

MacLean was supposed to go up in early 1987 but that flight, like everything else connected with the shuttle, has been delayed for an uncertain length of time.

The crash of the shuttle Challenger in January, the explosion of a Titan launcher last month and the continuing problems with the European Ariane rocket have put dozens of space ventures on hold while engineers seek ways of making their technology safer and more reliable.

The U.S. commission studying the Challenger disaster made dozens of recommendations for improving safety, and until engineers solve the problems it identified, the spacecraft is going nowhere.

But Chris Trump, vice-president of Spar Aerospace of Toronto, said his company is continuing work on three large space projects — two communications satellites and the planning program for the U.S. space station.

Spar, famous for building the shuttle's Canadarm, is in the same boat as other shuttle contractors.

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CANADA

## GOVERNMENT PURCHASE OF COMMUNICATIONS SERVICES EXAMINED

Ottawa THE CITIZEN in English 10 Jun 86 p B9

[Article by Brenda Stewart]

[Text]

Communications firms stand to gain from the federal government's plan to dole out more production work to the private sector.

In the past year more than \$6 million worth of communications work that would have been done within the government was given to the private sector. And, according to the department of Supply and Services, there's more where that came from.

The move is one of several initiatives introduced by the department to "convey more messages with less money."

Says Norman Manchevsky, director general of communications services in the department of Supply and Services: "It costs more to own it, than to buy it. More and more we are moving out of production, because it doesn't make sense to do it."

"If you have an audio-visual unit, you tend to produce audio visuals, whether you need them or not," he adds. Manchevsky thinks the move to outside suppliers will alleviate some of these problems and cut costs.

Co-ordinating the purchase of communications services from the private sector are two new groups — client services and a public relations task force.

The task force, made up of members from the public and private sectors, is to come up with ways to improve the efficiency and fairness in government procurement of communications services.

The client services group was set up to help government departments plan communications projects first before going to the private sector with a work order. They're being made to take a hard look at what they want to say and how they want to say it to ensure a clear message gets out in the most efficient way possible.

The focus is on planning before doing, a step that was often skipped in the past.

"Planning makes for much better communication," says Gerald Brown of Toronto-based PIR Communications Inc. It also saves money.

Now, private sector companies are being asked to submit proposals and cost estimates on a particular project, instead of simply delivering a brochure or a poster produced with very little direction from the buyer.

Then the department can choose the most cost-effective way of getting the job done.

"It's quite a significant change,"

says Don Reimer, executive vice-president of Hinds, Brian and Reimer Associates Limited, an Ottawa communications company.

"In order to justify the investment, we have to work much harder. It's easier to churn out brochures and press releases. Now there are objectives and a measure of results. It's really a shift toward better results."

That's because private sector firms, experienced in creating good visual material, will be in on a project almost from the beginning.

The client services group was formed less than a year ago and is made up of 18 to 20 staff working in Ottawa.

In most cases government departments can either go through Supply and Services, the government's central purchasing agent, for their communications work, or buy it themselves.

Manchevsky makes no secret of the fact that he would like to see the client services group work themselves out of a job. When government departments start to do their own communications planning, the group will become redundant.

"But my natural cynicism says it won't happen for five years," he says.

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CANADA

# INFOMART CEASING VIDEOTEX OPERATION

Toronto THE GLOBE AND MAIL in English 10 Jun 86 p B6

[Text]

Infomart Inc., the money-losing videotex division of Southam Inc., is ceasing operation of its Toronto Teleguide service July 9, the company says.

It had been attempting to find a buyer for the Teleguide system, an electronic catalogue of entertainment and services to Toronto visitors available on terminals around

the city. But the search was unsuccessful.

However, the company announced yesterday that Chronicle Videotex Inc., a subsidiary of Chronicle Publishing Co., publisher of the San Francisco Chronicle, has acquired all U.S. marketing rights to sell future Teleguide systems.

Chronicle Videotex president Abbott Ezrilov said Infomart's decision to transfer U.S. marketing rights and cease operation of the Toronto system does not affect development of the Teleguide network in the United States.

There, Teleguide systems are currently operating in San Francisco, San Diego, Sacramento, Phoenix, Las Vegas and Tampa.

Infomart said that, although the Toronto service did not succeed financially, the Teleguide applications around the world profited from the lessons learned from the Toronto prototype.

Infomart will continue to provide technical support for the software used in Teleguide systems around the world. It will not, however, be involved in marketing.

Last week, Mitsui & Co. Ltd. of Japan, the distributor of Teleguide systems in that country, announced the opening of a system in Sapporo, and said it plans to expand the network in the next 18 to 24 months.

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CSO: 5520/86

CANADA

SATELLITE COMMUNICATIONS ASSOCIATION ON GOVERNMENT POLICY

Toronto THE TORONTO STAR in English 10 Jun 86 p E3

[Article by Pat Brennan]

[Text]

While dozens of satellite receiving dishes scan the skies above the Skyline Hotel, hundreds of space communicators are inside wondering — is anybody up there listening?

By up there, they mean Ottawa.

The 200 founding members of the Satellite Communications Association of Canada say they are getting scrambled signals from Ottawa as to whether their high-tech industry is welcome here.

"The government contends it wants to see the growth and development of new technologies in Canada, and at the same time it stifles the manufacturing and distribution of satellite receiving equipment," says Samuel Singer, chairman of the association and president of GFA Technologies Inc. in Downsview, which manufactures satellite dishes.

"Ottawa says they want TV broadcasting made available to Canadians throughout the country, but they won't allow Cana-

dians to buy descramblers to use on the TV receiving equipment they already have in their homes," Singer said in an interview yesterday.

His association claims there are 175,000 privately owned satellite receiving dishes now in Canada and 90 per cent of them are in rural and isolated communities, without cable TV or with poor TV reception.

Singer said scrambled satellite signals from two major U.S. program producers can't be received without descramblers, which are illegal in Canada.

"The greatest number of Canadians can watch American TV either on cable or on air reception, but that is denied to our customers in rural and remote communities who rely on satellite TV, and it's not fair," said Singer.

He admitted, too, that the lack of descramblers for some popular U.S. satellite programs has hurt the sales of satellite receiving dishes and related equipment in

Canada.

"But we're having a tough time getting out the message that there will always be more unscrambled signals than scrambled signals."

The industry's major producers are holding their second annual trade show at the Skyline Hotel. The 50 satellite dishes in the back parking lot are all receiving signals from satellites hovering 22,000 miles above the Earth.

Singer said that when the first private dishes were manufactured and installed in 1977, they cost \$50,000 each.

Today, a receiving station averages \$3,500 installed.

"Satellite television has been the untold success story of the '80s in Canadian technology," Singer said. "We were world leaders in making satellite ground stations practical and affordable, and we could still have great achievements in the future if our government would either lead or get out of the way."

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CANADA

## METCAN SPECIALIZED SATELLITE EARTH STATION TRUCKS DESCRIBED

Ottawa THE CITIZEN in English 3 Jun 86 p D5

[Article by Paul Delahanty]

[Excerpts]

Building trucks for Africa would appear to be a task for a massive factory in the middle of a large manufacturing centre. But just off Merivale Road in Nepean there's a company doing just that.

Wayne Hovey, 37-year-old president of Metcan Fabricators Inc., has an office wall papered with pictures of several dozen of his specialized truck bodies.

Included are various kinds of lubrication and mobile service centres, machine shops, containers for materials from bombs to life-saving water, satellite dishes and oddly-shaped trailers.

You may have seen one of his trucks without knowing it. Many of Metcan's products are exported, but among the units that have stayed in Canada are mobile earth stations — the satellite dishes on top of trucks used by Telesat Canada — and the de-icing trucks used at airports to remove build-up from a plane before takeoff in winter conditions.

Metcan doesn't build the whole truck. "We usually start with a stripped-down chassis and build specialized boxes on top," Hovey says.

Container-type tops have included a bomb disposal unit for the

federal Department of National Defence; water carriers for the military as well as simplified water-tank units for use in drought-stricken areas of Africa; and even bodies without wheels — completely fitted metal boxes for shipment to the far north where they are bolted together to become complete living units for radar and weather station outposts.

By the time one of Metcan's trucks is finished, the original shape is unrecognizable. Some installations affect operation and movement as well. The satellite earth stations, for example, usually incorporate a levelling device to correct the effect of uneven roads or parking lots.

Hydraulic jacks allow the perfect levelling needed to direct the satellite dish. By monitoring several gauges, the operator can move each corner up and down until the truck is perfectly horizontal, a process that usually takes only a couple of minutes.

A similar levelling system was installed inside a van used to monitor pollution and the idea has been adapted to other projects where perfectly horizontal parking is needed, such as a mobile medical laboratory.

"We installed one system where

all the driver has to do is to push a single button and the truck levels itself in a few moments."

In 1985 Metcan had sales of \$1.2 million and expects to double that figure next year because of the new lines.

But it appears to be the specialized body work that makes Metcan unique and in demand for highly-different products, both in Canada and around the world.

"Other companies do many of the things we do," Hovey says, "but there is no similar company we know of that has the variety we do." That keeps the work interesting and also has given Metcan a reputation as a company that will tackle anything.

One of his mobile satellite dishes, for instance, was built on a special chassis: a large dish had to fit inside a very small truck body with all the equipment. Metcan put the dish on top of the front end of the box and it cleverly tucks away sideways when it is retracted.

"It went to the U.S. and it had to be smaller because the driver didn't have a licence to drive a big truck. We were the only ones who could do it and stay within the budget."

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CANADA

TELESAT BEGINS WORK ON TELEPORT COMPLEX IN MONTREAL

Toronto THE GLOBE AND MAIL in English 2 Jun 86 p B4

[Article by Lawrence Surtees]

[Text]

Telesat Canada has begun building one of the country's first teleport complexes, in a joint venture with Le Groupe SGD Inc. of Montreal.

The \$18-million communications satellite antenna park will be located close to the hub of Montreal's broadcast district on a downtown two-acre site bounded by Dorchester Boulevard and Papineau, Cartier and Ste. Rose streets.

Telesat is Canada's domestic communications satellite operator. Le Groupe SGD was created in 1980 as a real estate investor. It has since diversified into investing in high technology and new services.

The Téléport de Montreal will differ from similar complexes in North America because it is aimed at both broadcasters and telecommunications users of Telesat's

domestic communications satellites. Teleports, such as the one under construction on Staten Island in New York by the Port Authority of New York and Merrill Lynch is aimed predominately at business customers.

The Montreal teleport complex will include a four-story building equipped with a program production studio and multiple transmitting and receiving antennas designed for a variety of services. Users will also be able to access satellites owned by companies in the United States and some international satellites.

The first phase of the complex, occupying 80,000 square feet, is scheduled to open in July, 1987.

Telesat plans to build a network of teleports in major cities across Canada.

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CANADA

## TV OPERATORS URGE RELAXED CONTENT REGULATIONS

Windsor THE WINDSOR STAR in English 12 Jun 86 p C14

[Text]

HULL, QUEBEC (CP) — Pay television operators are sated with debt but starved for Canadian movies and have asked the federal broadcast regulator to let them cut their requirement to carry made-in-Canada content.

The two major players in pay, First Choice Canadian Communications Corp. of Toronto and Allarcom Pay Television Ltd. of Edmonton, say they can't manage with the current requirements for Canadian content. They maintain they need more relaxed rules on content if they are to survive as going concerns.

But not all the intervenors in the case before the Canadian Radio-television and Telecommunications Commission this week buy the arguments of the two companies, who together operate the First Choice-Superchannel movie network.

First Choice president Fred Klinkhammer told the commission his company has accumulated \$48 million in debt since it began operations in 1982. And he warned that unless the content rules are relaxed, with their heavy onus on the company to fund and support Canadian film, the shortfall will mount to at least \$77 million by 1989.

He said that to obey the current regulations will add to what he described

as "an already staggering deficit" and that the Canadian content minimum should be reduced to 15 per cent from 50 per cent.

DOUGLAS HOLTBY of Allarcom took the same line, arguing that his company's "present conditions of licence are unworkable," and said that the current hearing should not be so much about whether the licence should be amended, but how.

Allarcom currently supports a debt of \$18 million, which Holtby said will jump to \$45 million if the Canadian content rules are not changed.

Both companies presented detailed lists of the Canadian productions they have supported, altogether worth about \$70 million. And they promised that even if the Canadian content requirement is lashed, subscribers will see just as many Canadian movies, but they won't see them as often.

Klinkhammer says the repeat factor, in which subscribers are subjected to the same second-rate Canadian movies time after time, is the biggest single source of complaint from customers.

So instead of the present arrangement, First Choice and Allarcom want to change the minimum requirements for both content and for the financial commitments to made-in-Canada productions they agreed to when they

were granted their licences in 1982.

Right now, the two companies are supposed to spend 60 per cent of their revenues on Canadian programs, and Superchannel has heavy requirements to buy programming from Western Canada. They want that figure reduced to 50.1 per cent of "adjusted gross revenues," described as total revenues less operating expenses such as satellite time, overhead, promotion and management costs.

**THEIR OPPONENTS**, including the associations representing actors, directors and the independent film and television producers, say once all the expenses are deducted, there won't be anything left for productions.

The Association of Canadian Television and Radio Artists, ACTRA, told the CRTC that to allow the pay operators to cut their Canadian content would violate the Broadcast Act and make a mockery of the dearly held aim of making the country's airwaves more Canadian.

The ACTRA brief cited studies showing that Home Box Office in the United States carries almost 14-per-cent Canadian content, and that to allow the two supposedly Canadian pay companies to show only 15 per cent "would be preposterous."

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CANADA

BRIEFS

MITSUBISHI, CANADIAN ENTERPRISES PACT--The federal government has signed an agreement with Mitsubishi Corp to strengthen ties between the Japanese company and Canadian enterprises. In a letter of understanding, Canada and Mitsubishi agreed to co-operate in encouraging joint ventures, licensing agreements, joint research and development and investment between Canadian firms and Mitsubishi. The federal industry department and the Japanese firm will establish a joint working group to meet regularly to review their progress. The parties will concentrate on the manufacturing and service sectors, including aerospace, automotive, electronics, telecommunications, food processing and engineering plastics industries. [Text] [Toronto THE TORONTO STAR in English 12 Jun 86 p E11] /9274

CSO: 5520/86

HUNGARY

## INTERCSAT SCPC EQUIPMENT FOR SATELLITE COMMUNICATIONS

Budapest HIRADASTECHNIKA in Hungarian No 11, 1985 pp 481-488

[Article by Dr Andras Baranyi, Laszlo Uherezky, Dr Tamas Henk, Geza Kolumban, Dr Tamas Sarkany, Ivan Kaszavitz, Jozsef Papics and Dr Lajos Fures, of the Telecommunications Research Institute: "The INTERCSAT Channel Generating Equipment for Artificial Satellite Communications." Note that the CSAT part of INTERCSAT, pronounced INTERCHAT, comes from "csatorna," the Hungarian word for channel.]

### [Text] Summary

We describe the development of SCPC-PSK type channel generating equipment suitable for speech transmission via artificial satellite. After describing the operational principle and structure we discuss the problems of creating the critical subassemblies, then describe the design of the equipment and report on the results of the first artificial satellite tests.

### 1. Introduction

In the past decade speech transmission via geostationary artificial satellites has received an ever increasing role in international telephone traffic. Even at the beginning of the 1980's there were 200 earth stations in the INTELSAT network extending to more than 100 countries and an annual 25 percent growth characterizes the increase in traffic.

There has been a spread of SCPC (single channel per carrier) systems in the multiple access artificial satellite systems consisting of large numbers of earth stations with relatively little traffic in order to make optimal use of the band width and capacities of the artificial satellite retranslator. In these systems, as the name indicates, a separate carrier wave is used for each telephone connection, and in this way the equipment of the earth station can be linked up flexibly and can be easily further developed in accordance with the changing traffic needs of the network. The INTERSPUTNIK organization, of which our country is a founding member, created by the socialist countries also developed a global communications system based on the SCPC principle, like the INTELSAT system. In 1982, in order to improve the quality characteristics of the INTERSPUTNIK system and expand the network, the Telecommunications Research Institute in cooperation with the NIIR research

institute in Moscow began development of new channel generating equipment, the INTERCSAT equipment. With this task Hungarian communications engineering received a significant role in the further development of the INTERSPUTNIK system.

## 2. System Technology Characteristics.

Earth stations operating on the SCPC principle consist of two chief parts, the channel generating equipment itself and the microwave transmitter-receiver. The channel generating equipment receives the lines coming from the telephone exchanges and connects them, in the 70 plus or minus 18 MHz medium frequency band, to the microwave transmitter-receiver communicating with the artificial satellite. In accordance with the technical task the INTERCSAT equipment can be used independently in the standard 36 MHz frequency band of the satellite retranslators or it can cooperate with Soviet equipment already in operation in a free area of the band.

In the INTERCSAT equipment the transmission of the telephone channels takes place with digital phase modulation after analog-digital transformation. One can select between two types of modulation in accordance with the transmission needs. The possible operating modes are PCM/PSK-4 or ADM/DPSK-2. The modulation speed in both cases is 32 K baud. The width of the modulation spectrum determines the minimal value of the frequency distance for neighboring carrier waves. In the case of modulation at a speed of 32 K baud the smallest channel distance which can be realized is 45 K Hz. This channel distance is used in the INTELSAT system and in the course of developing the INTERCSAT equipment we selected this same channel raster in the interest of the compatibility of the two systems. Thus there is a theoretical possibility of building up a maximum of 400 duplex telephone channels in the 36 MHz channel available. In practice the useable channel capacity is influenced by the performance of the satellite retranslator and the modulation used. It is well known that the limitations deriving from the transmitter capacity of the retranslator can be mitigated if we disconnect the carrier wave in the speech pauses of the telephone connection. In order to reduce the load on the retranslator we use in the INTERCSAT equipment this so-called burst mode of speech transmission.

The level and frequency of the carrier waves arriving at the input of the channel generating equipment can vary due to changes in propagation characteristics and the individual transmitter-receiver parameters. But a constant level and frequency carrier wave is needed for good quality demodulation so, in order to eliminate level and frequency variations, we use a 70 MHz pilot signal in the middle of the band. Level and frequency deviations which cannot be corrected by pilot control are evened out by AGC and carrier restoration circuits used in the individual channel receivers.

The pilot signal is transmitted by a central pilot station and automatic level and frequency control take place at every station of the earth network on the basis of the received pilot level and pilot frequency. In addition we use the pilot signal to aim the antenna of the earth station.

Should the pilot signal fail the entire earth network would become inoperable, so the central pilot station is supplemented by an auxiliary pilot station. This, however, transmits a pilot signal not at 70 MHz but rather at frequency  $f_s$  which is received only by the two pilot stations. If the auxiliary pilot station stops receiving the 70 MHz pilot signal while it continues to receive its own  $f_s$  pilot signal this means that the central pilot station has ceased transmitting the 70 MHz pilot signal. Then the auxiliary pilot station automatically switches to transmission of the 70 MHz pilot signal instead of the  $f_s$  frequency pilot signal. The switch takes place in a maximum of 4 seconds, while every pilot receiver of the earth network maintains the AGC, AFC and antenna aiming voltage established before the disappearance. Then the operation of the pilot receivers continues by receiving the 70 MHz pilot signal transmitted by the auxiliary pilot station.

### 3. Structure of the Equipment

Figure 1 shows the outline structure of the entire INTERCSAT equipment. The task of the channel units is to produce the medium frequency carrier wave modulated by the speech signal or to restore the speech signal by demodulation of the medium frequency carrier wave. There are as many channel units at an earth station as the speech channels it is built to pass on; a maximum of 64 channels can be installed at one station. The PCM/ADM unit of the channel block transforms the speech signal into a digital signal series with a speed of  $2 \times 32$  K bits per second, or it restores the speech signal from the arriving signal series. We developed two versions of analog-digital conversion for processing the speech signal in the INTERCSAT equipment; the PCM version was developed at the TKI [Telecommunications Research Institute] and the model for the ADM version was developed at the NIIR institute in Moscow. It is the task of the PSK unit to produce a PSK signal falling in the 70 plus or minus 18 MHz band from the input  $2 \times 32$  K bit per second signal series or to demodulate the received PSK signal.

On the right side of the figure we have shown the so-called common units of the equipment. The function of the transmitter block is to sum and amplify the medium frequency carrier waves carrying the PSK modulation and connect them with the medium frequency input of the microwave transmitter. At the pilot station, in addition to this, the pilot signal is produced in the transmitter block. The task of the receiver block is to amplify, filter and separate for the channel units the medium frequency signals coming from the microwave receiver. In addition to this the pilot signal demodulation takes place in the receiver block, and thus the AGC, AFC and antenna aiming signals are produced.

A separate local block serves to produce the high stability local signals, which are produced in three characteristic frequencies. The 45 K Hz signal corresponds to the already mentioned frequency raster and is needed to set the channel carriers. We use the 8 MHz signal in the channel units to produce and process the digital signals, and we use the 46 MHz signal in the PSK unit for transposition. A failure of the common equipment would result in the simultaneous interruption of all channels and thus in the inoperability of the station, so we have supplied the common equipment with spares. The blocks shown in broken lines indicate this in the figure.

Two carrier frequency pairs serve to establish the service links in the INTERCSAT equipment; in accordance with this we have installed two service channel blocks at every station in addition to the traffic channel blocks. Control of these is provided by service equipment consisting of the coupling block and the service terminal. The service equipment can be used not only to establish a telephone link but also a teletype link; a separate article describes its detailed structure, operational mode and special services.

### 3.1 The Channel Unit

Difficulties in creating the INTERCSAT equipment appeared primarily in the course of developing the channel unit, so we should review in a little more detail the operation of the channel unit and the circuit solutions used.

Figure 2 summarizes the characteristic data connected with PCM transmission. In the INTERCSAT equipment the analog speech signal is transformed into a PCM signal consisting of 7 bit code words. Thus with the customary 8 K Hz sampling the speed of the coded signal is 56 K bits per second. As we mentioned, we use the burst mode for speech transmission, so there is no carrier wave in the pauses in the speech. To do this we use a speech detector which has the task of producing a signal to switch the carrier wave on the basis of noting a speech signal. The difficulty of burst operation is that the carrier and clock signals needed for demodulation must be synchronized anew at the receiver side at the beginning of every burst. To do this a pre-code is used at the beginning of the burst; we transmit a continuous 1 series for 20 bits and then an alternating 1-0-1-0 series for 40 bits to establish the synchronism.

In the INTERCSAT equipment, in the case of PCM operation, we use PSK modulation instead of the more customary DPSK modulation. This results in a certain reduction in noise, but it is accompanied by phase uncertainty. To eliminate this and to provide frame synchronization of the PCM signals we insert synchronizing words lasting 0.5 milliseconds every 4 milliseconds into the 56 K bits per second speech signal series; these are the so-called SOM (start of message) signals, by insertion of which the speed of the original signal series increases to 64 K bits per second. This signal series is connected to the input of the PSK modulator.

Figure 3 shows the functional structure of PCM signal processing. We realized signal processing with a modern multi-microprocessor design; its task, in the direction of the PCM codec, is to receive and issue the data, compile the line frame and carry out the functions connected with speech detection and, on the receiver side, to resolve the phase uncertainty. The new feature of the solution is that speech detection takes place by setting an adaptive threshold, so the switching on and off of the carrier wave takes place in accordance with the line noise level at the time. We use a highly integrated PCM codec for coding and decoding the speech signal.

Now let us look at operation of the PSK part on the basis of Figure 4. On the transmitter side the arriving 2 x 32 K bit per second signal series modulates the carrier wave in every channel unit at the same frequency, about 46 MHz. The channel synthesizer on the transmitter side transposes the frequency of the signal carrying the PSK modulation to an appropriate frequency of the 70

plus or minus 18 MHz medium frequency band. The frequency of the synthesizer can be set to 800 different values corresponding to the raster which has been described.

On the receiver side we select the carrier wave to be demodulated from among the carrier waves arriving in the 70 plus or minus 18 MHz medium frequency band by means of threefold transposition. The value of the third medium frequency is 512 K Hz; the demodulation takes place at this frequency. In the course of the transpositions we gradually reduce the band width so that what appears at the input of the demodulator is essentially only the carrier selected, and the interference of the neighboring channels has been reduced to a negligible value. The first transposing signal is provided by the channel synthesizer on the receiver side, which like the synthesizer on the transmitter side can be set to 800 different frequencies. We use the signal coming from the local supply block, at about 46 MHz, for the second transposition, while the third transposition takes place with the 5.552 MHz signal provided by the pilot receiver, the frequency of which follows with a good approximation the frequency variations of the incoming pilot signal. So after the transpositions much of the plus or minus 60 K Hz frequency error permitted in the technical task has been eliminated and only the incidental errors which could not be followed by the pilot receiver remain. According to the system plan the size of these is a maximum of plus or minus 3 K Hz, which is still considerably greater than the customary value for similar equipment and could substantially complicate the realization of good quality demodulation.

The PSK demodulator demodulates the 512 K Hz PSK signal; Figure 5 shows the structure of this. We use a two path coherent quadratic demodulator to demodulate the four state PSK signal. A carrier restorer produces the carrier wave necessary for coherent demodulation; it contains an analog PLL loop considerably more complicated than customary. The synchronous detectors are followed by baseband filters, comparators and sampling circuits. We produce the clock signal needed for sampling with a clock signal restorer using a digital PLL circuit. An essential new feature of the demodulator layout is that a large part of the signal processing functions are realized in the baseband. The relatively large input frequency error mentioned above justifies this; it can be completely eliminated in the course of baseband processing.

Implementing the filter functions required special consideration. The task of filtering is twofold. On the one hand it must suppress the carrier waves of neighboring channels, and on the other hand it must ensure satisfaction of the Nyquist requirements necessary for distortion free transmission. In the usual case a single filter takes care of both tasks. In the demodulator of the INTERCSAT equipment suppression of disturbing interference is realized in the carrier frequency band with a 512 K Hz band filter at the input, while development of the Nyquist characteristic takes place in the baseband, with a low-pass filter placed before the comparator.



The carrier circuits containing the PLL loop and the clock signal restoring circuits are realized with switchable band width loop filters. At the beginning of the burst, during the time of the pre-code, setting a large band width makes possible swift operation of both circuits in the interest of fast synchronization, while during speech transmission we ensure the necessary interference protection by switching in filters with small band width.

### 3.2 Common Units

The transmitter, receiver and local units are "common" units, since all the channel units of a station use them jointly. While the failure of a channel unit would result only in interrupting the channel in question, the failure of a common unit would render the entire station inoperable. Therefore, in the interest of increased reliability, we backup the common units; we use two identical units (designated "A" and "B") and in the event of the failure of any of them there is an automatic switch over to the reserve unit. In the case of the transmitter block the switchover is controlled by a continuity pilot signal outside the medium frequency band; in the case of the receiver block it is controlled by the disappearance of the reception pilot signal. In the local block the control circuit watches the level and frequency of all three local signals produced, and in the event of an error in any of the local signals the three output points switch simultaneously to the reserve circuit.

The function of the transmitter block is to sum the channel signals coming from the channel transmitters, amplify the summed signal spectrum and connect it to the medium frequency input of the microwave transmitter (Figure 6). After passive signal summation the medium frequency signals coming from the channel transmitters pass through a band filter the function of which is suppression of the undesired sideband products of the transposition used in the channel transmitters. Then the summed medium frequency signal is connected to the input of the medium frequency transmitter amplifier of branches A and B by means of hybrid branching. The medium frequency amplifiers are broad-band small-distortion circuits in which a complex feedback network ensures a reduction in intermodulation distortion.

The output of the two medium frequency amplifiers is connected to the input of the microwave transmitter through a switch-over, a band filter and a level regulator. With the level regulator one can set the transmitter side medium frequency level in accordance with the geographical location of the earth station and the antenna gain.

At the two designated pilot stations the transmitter block has the additional function of producing the pilot signal and summing it with the channel signals. The pilot signals are produced by mixing the signals of two synthesizers, thus the pilot frequency is given as the difference between the frequencies of the two synthesizers (Figure 8a). In accordance with the reserve system outlined in the second point the pilot synthesizer can be connected to two different frequencies; its structure is similar to the synthesizers used in the channel unit. The other synthesizer produces a fixed 46.1 MHz frequency signal, which differs by half a channel raster from the 46.1225 MHz frequency used for transposition of the channel carriers. This gives the 70 MHz or fs frequency pilot frequency corresponding to the system

technology requirements. The two synthesizers are in phase rigid contact, since both are controlled by the 45 K Hz reference signal of the local supplier. The output band filter of the transmitter block, Figure 6, serves to suppress the undesired mixing product of the pilot transmitter and the continuity pilot signal outside the band used to watch the medium frequency amplifier.

The chief task of the receiver block is to amplify and filter the channel signals coming from the medium frequency output of the microwave receiver and separate them for the individual channel receivers. A separate unit in the receiver block serves to receive and process the pilot signal. By processing the pilot signal it produces:

- the AGC voltage regulating the medium frequency amplifier of the receiver block,

- the transposing signals, with a frequency of about 5 MHz, needed to control the frequency of the channel receivers, and

- the antenna aiming signal needed to control the antenna of the earth station.

In Figure 7, of the receiver block, one can see according to a simplified block diagram how the medium frequency signal coming from the microwave receiver passes through a band filter ensuring image selectivity of the receiver, then through a hybrid branch to the receiver medium frequency amplifier of branches A and B. The medium frequency amplifiers of the receiver block must satisfy especially severe distortion requirements, since it must drive 400 channel carriers (as opposed to the medium frequency amplifiers of the transmitter block which control a maximum of 64 channels). The value of the output "intercept" point characterizing linearity is 25 dBm.

The medium frequency amplifiers of the receiver block have two outputs. One output feeds the channel receivers through a switch-over, band filter and branching net. The other output is linked to the pilot receiver, a detailed block diagram of which is shown in Figure 8b. As can be seen in the figure, the pilot receiver, like the channel receivers, contains three transpositions. The third transposition takes place with a VCO signal with a nominal frequency of 5.552 MHz, the phase of which is controlled by the PLL loop so that the frequency of the VCO follows a change in the frequency of the reception pilot signal of a maximum of plus or minus 60 K Hz; this guarantees that the frequency of the signal going to the channel demodulator should be constant within plus or minus 3 K Hz.

In accordance with the technical requirements the pilot receiver must ensure the high reliability reception of the pilot signal even with a large noise level and must ensure the reserve function already mentioned in section 2 in the event of the absence of the pilot signal. We ensure this with selectivity ensuring interference protection and by using a search circuit. If there is no pilot reception the search circuit sweeps the frequency of the VCO in the plus or minus 60 K Hz range and after finding the pilot signal an FM demodulator gives a control signal which results in the frequency of the VCO approximating

the nominal value of the third medium frequency and thus in closing the PLL loop. A separate AM demodulator provides the already mentioned AGC and antenna aiming voltage.

The third common unit of the INTERCSAT equipment is the local supplier the function of which is to provide the following signals:

--a 45 K Hz reference signal for the synthesizers of the channel units and for the synthesizers of the pilot transmitter and pilot receiver;

--an 8.192 MHz clock signal for the PCM codec, the ADM codec and the clock signal restoring units; and

--a 46.1225 MHz transposing signal for the channel transmitter, channel receiver and pilot units.

Figure 9 shows the structure of the local supplier. In order to ensure the especially strict frequency stability, a value of  $10^{-7}$ , we generate the local signals from a 7200 K Hz crystal oscillator placed in a constant-temperature container. The 45 K Hz signal is provided directly by a digital frequency divider while the 8.192 MHz and 46.1225 MHz signals are produced by oscillators controlled with a PLL circuit. The optimal band width of the PLL loops ensures the great signal purity demanded of the local signals. Since there are especially severe requirements that the 45 K Hz reference signal be free of disturbance and since the null junctions of the reference signal establish the frequency of the synthesizers, we use a steep square signal as a reference to reduce phase jitter.

In accordance with the foregoing, the channel unit and the common transmitter and receiver units use frequency synthesizers to transpose the channel signals or the pilot signal in the INTERCSAT equipment.

The synthesizers are made with PLL circuits containing a digital frequency divider. The problems in designing the synthesizer circuits were the relatively broad frequency span and meeting the strict prescriptions pertaining to thermic noise and periodic disturbances. We solved these problems by optimizing the loop band width and by using a special phase detector. A separate article describes the synthesizers.

### 3.3 Station Layout

The model station for the INTERCSAT equipment is made up of "SLIM RACK" type columns which divide up into blocks containing functional equipment components. As an example Figure 10 shows the column layout of an INTERCSAT station built for six channels. On the right are three so-called channel columns in each of which there are two channel blocks, with the power units belonging to them, while in the so-called common column one can find the transmitter, receiver and local block, with the reserve power units supplying them. The left so-called service column contains the coupling block for the service equipment and a current distribution block to supply current to the several power units. All controls and indicators are placed on the front panels. Repair work is facilitated by the fact that the blocks and the units

in them can be exchanged simply. Instruments to be created in the course of further development will go in the striped areas. The channel capacity of the station can be expanded simply by subsequent installation of additional channel columns.

#### 4. Concluding Observations

The first laboratory samples of the units of the INTERCSAT equipment were prepared in 1984. With these, at the end of the year, we established a successful link between the Hungarian earth station in Taliandorogd and the Soviet earth station in Dubna. In addition to meeting the technical requirements the measurements made at the stations proved that from the viewpoint of speech transmission the equipment could cooperate with the SCPC equipment made in the West. Two four-channel sample stations of the INTERCSAT equipment were prepared in 1985. We installed one sample station in Dubna in the fall of 1985 and we will deliver the second station to Taliandorogd to start test operation between the two sample stations.

In the course of developing the INTERCSAT equipment we checked fulfillment of the strict technical requirements with a large number of precision measurements. The most important of these proved to be spectrum analysis, with a high resolution capability and a dynamic range, and the measurement of error ratios. As an example Figure 11 shows oscillograms obtained with the Dubna sample station which we obtained with a medium frequency short circuit loop of the transmitter and receiver blocks, adding noise simulating artificial satellite transmission. In the phasor diagrams on the left one can see the interference effect of the noise superimposed in the course of 4PSK transmission and the neighboring channel, while the test signal figure on the right show the noise and interference tolerance of the speech transmission--observable signal distortion does not occur in the case of the signal/noise relationship and interference involved.

#### 5. An Expression of Thanks

Thanks are due to all our colleagues who gave valuable aid to the development of the INTERCSAT equipment by clarifying systems technology questions and developing subassemblies. They reported on their work at the Microwave Seminar held in January 1985. The aid of the designing and implementing collectives had a significant role in developing the prototypes of the equipment. Thanks are due to the leadership of the TKI for initiating the development of the program, especially to Dr Gyula Tofalvi, scientific director, and Dr Ferenc Rakosi, chief engineer, who aided our work with their constant attention and support. We received fundamental aid in developing the equipment from the scientific collective led by L. J. Kantor at the NIIR research institute in Moscow.

## BIOGRAPHIC NOTES

Dr Andras Baranyi obtained his degree in electrical engineering in 1960 at the Budapest Technical University. He has worked at the Telecommunications Research Institute since 1960. At first he dealt with the design of electronic circuits for microwave radio equipment and with distortion problems of FM systems. Between 1973 and 1976 he directed the development of data transmission modems. Since 1982 he has been dealing with development of artificial satellite telephone links. Since 1965 he has given lectures within the framework of special engineering at the Budapest Technical University. He worked as guest researcher at the University of Maryland in 1970 and at Berkeley University in 1981. His research area is the theory of nonlinear networks. He earned a candidate's degree in this subject in 1976.

Laszlo Uherezky obtained his degree in communications engineering at the Budapest Technical University in 1966. Between 1966 and 1977 he worked on development at the Telephone Factory, from 1973 as chief of the Computer Technology Development Main Department. He has worked at the TKI since 1977 and is now a scientific department chief. In 1970 he continued his studies on a scholarship in Japan at Fujitsu Ltd. and the Tokyo University. In 1978-79 he dealt with a study of the characteristics of data transmission protocols as a guest researcher in England at the National Physical Laboratory. His professional interests are computerized communication and microprocessor systems.

Dr Tamas Henk graduated from the Electrical Engineering School of the Budapest Technical University in 1973. Since then he has participated in the computer aided design of a family of data transmission modems at the TKI and in development of the INTERCSAT equipment. His research areas are linear and nonlinear network theory, data transmission and digital signal processing. From 1977 to 1979 he had a scholarship at Dublin University in the area of filter design. In 1980 he received his doctorate in data transmission and in 1985 he won a degree as candidate in technical sciences in the area of filter design.

Geza Kolumban obtained his degree in electrical engineering in 1976 and as an engineering teacher in 1977 at the Budapest Technical University. Between 1976 and 1980 he dealt with development of local generators for microwave radio relay equipment at the Developmental Institute of the Precision Engineering Enterprise. He came to the Telecommunications Research Institute in 1980 as a scholarship graduate student and has been a scientific worker there since 1983. He joined in the developmental work on the local supply system for the INTERCSAT satellite communications equipment in 1982 and in research on synthesizers with short frequency changing times. His professional interests are in the theory of nonlinear, periodic control systems. He is now working on his candidate's dissertation, the theme of which is the theory of indirect, periodic local generators.

Dr Tamas Sarkany obtained his doctorate in physics and mathematics at the Peter Pazmany Science University and, after 1950, was a founding member of the Telecommunications Research Institute and is presently a scientific adviser for it. He developed a number of electronic instruments at the TKI,

participated in the development of radio relay equipment and dealt with the development of contacts between the institute and leading foreign instruments factories. At present he guides documentation work for the INTERCSAT satellite transmission equipment. He has given a number of talks at foreign conferences and at microwave colloquiums in Budapest. He is a candidate in technical sciences, an Outstanding Worker of the Machine Industry and owner of the Virag-Polak Prize. He is author or co-author of more than 20 publications and 13 patents. As member for Hungary of one of the work groups of the IEC he has contributed outline material for the working out of international standards pertaining to measurement methods for microwave systems.

Ivan Kaszavitz graduated from the instruments and control technology branch of the Electrical Engineering School of the Budapest Technical University in 1972. He has been working at the Telecommunications Research Institute since 1973. In the first years he participated in development of digital control circuits for an experimental quasi-electronic telephone exchange. Following this his task was development of logic controls for automatic calling equipment which could be connected to data transmission modems and the realization of the circuits. Since 1982 he has been working on development of the INTERCSAT channel generating equipment. His task was development of the clock signal restoring circuit for the demodulator. In addition he undertook an important role in channel block tasks and then in testing the entire system.

Jozsef Papics graduated with honors from the systems technology branch of Form B of the Electrical Engineering School of the Budapest Technical University in 1979. Since then he has been working at the TKI, at present in a scientific worker assignment. After his entry he dealt with microwave nonlinear circuits and since 1983 he has participated in development of the INTERCSAT channel generating equipment. His narrower theme area is the carrier restoring circuit of the PSK demodulator and systems measurements. In 1983 he won a special engineering degree, with honors, in the radio communications special engineering section of the Electrical Engineering School of the Budapest Technical University.

Dr Lajos Furjes obtained his electrical engineering degree in 1975 and his special engineering degree in 1976 at the Budapest Technical University, within the framework of day special engineering training. In 1977 he defended his technical doctorate thesis. He has been working at the Telecommunications Research Institute since 1976. His research area is frequency range periodic analysis of nonlinear circuits. Since 1982 he has participated in the development of the INTERCSAT equipment by solving circuit, heat technology and design questions.

#### FIGURE CAPTIONS AND KEYS

Figure 1. Structure of the INTERCSAT Equipment

Key:

- |                |                               |
|----------------|-------------------------------|
| 1. Channel 1   | 8. From microwave transmitter |
| 2. Transmitter | 9. Service equipment          |

3. To microwave transmitter  
4. Speech signal  
5. To transmitter  
6. To receiver  
7. Receiver

10. Service terminal  
11. Coupling block  
12. Channel n  
13. Local  
14. Speech signal

## Figure 2. Characteristics of PCM Speech Transmission

Key:

- |                   |                                   |
|-------------------|-----------------------------------|
| 1. A/D conversion | 5. Pre-code at beginning of burst |
| 2. Burst mode     | 6. PCM frames                     |
| 3. Speech         | 7. Speech information             |
| 4. Pause          |                                   |

## Figure 3. Functional Structure of PCM Signal Processing

Key:

- |                         |                            |
|-------------------------|----------------------------|
| 1. Speech               | 4. System bus              |
| 2. PCM codec            | 5. Channel synchronization |
| 3. PSK modem connection | 6. Speech detector         |

## Figure 4. Structure of PSK Unit; a. PSK Transmitter; b. PSK Receiver

Key:

- |                            |                         |
|----------------------------|-------------------------|
| 1. Carrier                 | 4. From local unit      |
| 2. Transmitter synthesizer | 5. Receiver synthesizer |
| 3. From pilot receiver     |                         |

## Figure 5. Coherent PSK Demodulation

Key:

- |                     |                          |                    |
|---------------------|--------------------------|--------------------|
| 1. Carrier restorer | 2. Clock signal restorer | 3. Sample receiver |
|---------------------|--------------------------|--------------------|

## Figure 6. Structure of Transmitter Block

Key:

- |                        |   |
|------------------------|---|
| 1. Pilot signal        | 4. From medium frequency channel transmitters |
| 2. Pilot transmitter * |   |
| 3. Channel signals     | 5. * Only at pilot station                    |

## Figure 7. Structure of Receiver Block

Key:

- |                          |  |
|--------------------------|--|
| 1. Pilot synthesizer     | 4. To 5.552 MHz channel receivers        |
| 2. Pilot receiver        | 5. To medium frequency channel receivers |
| 3. Antenna aiming signal |  |



Figure 8. Pilot Block Diagrams; a. Pilot Transmitter (only at pilot station);  
b. Pilot Receiver

Key:

- |                         |  |
|-------------------------|--|
| 1. Pilot synthesizer    | 4. VCO, to 5.552 MHz channel receivers |
| 2. Search circuit       | 5. Antenna aiming signal               |
| 3. Synthesizer, shifter |  |

Figure 9. Structure of Local Block

Key:

- |                      |                              |
|----------------------|------------------------------|
| 1. Frequency divider | 2. Reserve frequency divider |
|----------------------|------------------------------|

Figure 10. Layout of INTERCSAT Station With 4 Traffic and 2 Service Channels

Key:

- |                    |                         |
|--------------------|-------------------------|
| 1. Power unit      | 7. Service terminal     |
| 2. Service channel | 8. Service channel      |
| 3. PCM channel     | 9. PCM channel          |
| 4. Transmitter     | 10. Current distributor |
| 5. Receiver        | 11. Local block         |
| 6. Coupling unit   |                         |

Figure 11. Phasor Diagram and 840 Hz Sine Signal Oscillogram in Medium  
Frequency Shortcircuit

- a. Without neighboring channel and thermic noise
- b. With neighboring channel modulated by random signal at plus 7 dB compared to measured channel, without thermic noise
- c. With thermic noise corresponding to an error ratio of  $10^{-6}$  (S/N approx 13 dB,  $S/N_0=60.3$  dBHz), without neighboring channel

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HUNGARY

## SYSTEM TECHNIQUES OF PCM CHANNEL UNIT OF INTERCSAT

Budapest HIRADASTECHNIKA in Hungarian No 11, 1985 pp 489-493

[Article by Erno Bacs, Mihaly Gubanyi, Lajos Hanzo, Laszlo Hinsenkamp and Laszlo Uherezky, of the Telecommunications Research Institute: "System Technology and Realization Problems of the PCM Channel Unit of the INTERCSAT System."]

### [Text] Summary

In SCPC (Single Channel per Carrier) systems the task of the voice frequency channel unit is to perform the A/D and D/A conversions, produce and break down the prescribed block structure, pick up and maintain block synchronism and perform speech detection. The complexity of the task to be solved is described after formulating the system technology task and stressing the computation intensive partial tasks. Knowing this a number of solution possibilities offer themselves--special purpose hardware, a multiprocessor consisting of 8 or 16 bit MOS processors and special purpose fast circuits or a bit slice processor. The various solutions have different advantages and disadvantages. The factors to be considered are cost, power use, the need for developmental work, the technical level, etc. In addition to describing the realization chosen on the basis of the above factors--a multiprocessor based on an I 8085--we turn to a discussion of the more demanding system technology problems.

### 1. Introduction

In our day microelectronics offers rich possibilities and a multiplicity of alternatives for the realization of electronic equipment. In the given case the question is what sort of parts base and what sort of architecture we should choose for realization of a PCM channel unit in order to optimize the manifold and often contradictory aspects of design, development, manufacture and operation.

In the second chapter of the work we describe the structure and functions of the PCM channel unit and all the connections into the system; in chapters 3 and 4 we compare the possible alternatives; in chapter 5 we talk about the MOS multiprocessor chosen, based on the I 8085; and finally in chapter 6 we summarize our experiences in realizing the device.

## 2. The Tasks of a PCM Channel Unit

We summarize the tasks of a PCM channel unit in figure 1 where we have also shown the prescribed block structure (see Figure 1a).

The tasks of the channel unit from the transmitter side are the following:

--Prior to A/D conversion we must restrict the analog signals coming from the input of the speech channel to the customary speech band (0.3-3.4 kHz) in the interest of adhering to the sampling formula.

--After "A" law companding the filtered analog signal must be subjected to 7 bit A/D conversion at a sampling frequency rate of  $f_{mv}=8$  kHz and as a result of this we get a serial data flow at a speed of 56 K bits per second.

--We must perform speech detection on the 7 bit PCM words thus produced in order to distinguish speech from speech pauses, that is the state when only noise reaches the input of the channel unit. At such times we suppress the carrier for the given channel, thus saving satellite power and reducing the load on the on-board translator which has a limited capacity. Since the adaptive threshold controlled speech detection used is one of the most demanding tasks of the PCM channel unit we used this task a number of times as a test program in the course of selecting among the various realization alternatives for a PCM channel unit. We should mention here that the "Speech Level Regulator" adjusts the detection threshold level of the "Speech Detector" adaptively to the level of the channel noise at all times thus making possible optimal speech detection.

--Figure 1a specifies additional tasks--frame organization--to be performed in the transmitter. The task of the "Synchronous Signal Generator" and "SOM Generator" which can be seen in Figure 1b is building up the frame structure which can be seen in Figure 1a, the details of which we analyze below. We insert before every speech segment--indicated by the speech detector--a pre-code consisting of 40 bits to facilitate carrier restoration and of 80 bits to support synchronization restoration. This is followed by the 32 bit fixed content segment designated SOM in the figure (SOM=Start of Message), the hexadecimal value of which, together with the pre-code, we give in Figure 1a. The task of the SOM segment--considering that the system specification prescribes state phase modulation (4PSK)--is to make it possible to filter out in the receiver the phase uncertainty deriving from the shifting of the carrier cross. The 32 bit SOM thus inserted is followed by  $32 \times 7=224$  bits of data information, and this gives the bit speed of 64 K bits per second.

--The serial-to-parallel transformer passes this serial data line to the 4PSK modem as dibits at a signal speed of 32 K bits per second and the modem assigns the given speech channel to one of the carriers of the 70 plus or minus 18 MHz band which can be separated from one another by a distance of 45 or 80 kHz.

The tasks of the receiver side of the channel unit can be summarized as follows (see Figure 1):

--The SOM detector receives the bit line arriving from the PSK modem at a speed of  $2 \times 32$  K bits per second. The SOM detector is a 32 bit correlator supplemented by an algorithm increasing decision confidence. The algorithm increasing its decision confidence is as follows. The SOM detector constantly shifts a window 32 bits long along the signal line received and indicates if it finds in it a segment which agrees with the SOM for at least 30 bits. It accepts this as a start of message only provisionally and tests to see if it finds another segment of at least 30 bits which agrees with the SOM at a distance of 256 bits, that is 4 milliseconds. If so then it presumes that this is the start of the message--that is, that we have not detected a chance SOM out of noise--and following this it searches for the SOM at the place designated in the received signal line. After that the SOM has to be in error for more than 2 bits at least five times one after another for us to drop out of the hypothesized synchronous state and again return to a bit by bit SOM search.

--With the aid of the "Synchronism Detector" and "Phase Status Decoding" blocks in Figure 1b we break down the frame structure built up on the transmitter side, compensate for the shifting of the carrier cross and with the aid of the parallel-to-serial transformer designated P/S we restore the given 56 K bit per second bit line.

--This is followed by "A" law expansion and 7 bit D/A conversion.

--Finally the analog speech is produced through a reconstructing low pass filter.

### 3. Possible Realization Alternatives

In order to choose among the realization alternatives it is useful to supplement the specifications outlined on the basis of the above by noting that the advantage must be given to a version which makes possible the better realization of the speech detector, for the noise and disturbance sensitivity of the speech detector or the distortions introduced by it are of fundamental significance in the indexes of the entire system. In the interest of choosing among the realization possibilities we established criteria and gave points to the criteria from zero to ten and gave the maximum points to the best solution from the given viewpoint. We built up the criterion system in such a way that its elements have more or less the same weight in the entire solution.

The criteria were:

#### a. Consumption

The space bundle used by the INTERCSAT equipment has a maximum capacity of 800 channels; this is large but in general the simultaneous operation of 30-50 channel units appears to be the realistic possibility. Thus the channel unit basically determines the total dissipation of the INTERCSAT equipment, for at such times the consumption of the common units has little weight in total consumption.

#### b. Time and Work Needed For Development

The time limit for research and development work has to be adjusted to the entire system; fast development is an essential condition for success. Obviously from this viewpoint those solutions are valuable where there is a possibility for direct use of computerized simulation, that is where as many as possible of the research and development jobs can be automated.

#### c. Flexibility

Our immediate task was to develop a speech channel with INTERCSAT/INTELSAT specifications, but at the same time it could be foreseen that a task for the near future would be realization of a 48 K bit per second error protected speech channel and stereophonic sound transmission. From this viewpoint those solutions are attractive which make possible expansion, "saving" the subassemblies in more or less unchanged form and making modifications with little sacrifice.

#### d. Parts

It is essential that the components be available from several sources, and the increase in reliability offered by highly integrated elements is obvious.

#### e. Space Requirement

Even during the discussion of the earlier criteria it was mentioned that there would be a need for 30-50 channels at an earth station, so it is not a matter of indifference how much space is needed by the units which would be repeated for every channel.

#### f. Maintenance

The level of maintenance, finding failures and repair is a very important factor when one looks at the entire life cycle of complex electronic equipment. The level of the test and diagnostic functions is a crucial factor in operation and the ability to use them in manufacture has very serious advantages.

#### g. Economicalness

Here we must think not only of minimizing the production price of the several subassemblies but also of optimizing the price of the entire channel unit. Obviously the use of units which can be repeated within one piece of equipment offers a significant economic advantage in manufacture and development.

We analyzed the realization of the specifications in the following versions:

- TTL SSI, MSI circuits,
- CMOS SSI, MSI circuits,
- Bit-slice processors, and
- MOS processors.

We compared these versions with the criterion system outlined earlier and we give the evaluation in Table 1.

Table 1: Comparison of Realization Alternatives for a PCM Channel Unit

	Consumption	Work, time need	Flexibility	Parts	Space need	Maintenance	Economicalness
TTL circuits	5	6	0	10	6	3	6
CMOS circuits	10	6	0	3	6	3	6
Bit-slice proc.	3	4	8	5	10	5	7
MOS processors	8	10	10	10	8	10	10

#### 4. Performance Capability of an MOS Microprocessor

As a result of the preparatory, analytical work we chose a design based on MOS microprocessors. We made the choice among commercial processors by sticking to one critical task out of the functions to be realized--adaptive threshold control of the speech detector--and we measured the execution time for this by simulation. In the simulation we also made the programming tools a subject of the test. Here we put in the balance Assembler, which means fast execution, a memory saving solution, but exhausting and thus a large volume of work, and an elegant, easily documented, clear but less fast and memory wasting high level language (CORAL 66).

Table 2. Comparison of the Speeds of MOS Processors Programmed in Different Languages

Processor	Program language	Microcomputer used in simulation	Clock signal	Running time in micro-seconds
INTEL 8080	ASM 80	MDS 800	2 MHz	110
	PLM 80	MDS 800	2 MHz	165
	CORAL 66	MDS 800	2 MHz	130
INTEL 8085	CORAL 66	IPC 85	4 MHz	97
INTEL 8086	ASM 86	SDK 86	5 MHz	38
	PLM 86	SDK 86	5 MHz	44
	CORAL-CONV 86	SDK 86	5 MHz	58

As we already mentioned, running on various machines versions of adaptive threshold control for the speech detector programmed in different languages constituted the subject of our study. And we made the processor choice on the basis of a price/operating speed criterion. We have summarized the result of this simulation in Table 2.

## 5. The Multiprocessor

The foregoing has shown--within the possibilities of a brief article--the path by which we arrived at the choice of a multiprocessor made up of four 8085 processors. The several microcomputers communicate with one another, with a common memory, with signal transformers, with operating controls and with special hardware elements on a common bus. We segmented the task to be performed so that the four microcomputers operate with more or less the same load. Adaptive threshold control and information transmission are in essence alternative processes, so only one of the tasks always represents a load on the two microcomputers working in the transmission direction. Nor do the test programs checking operability represent a simultaneous load. We can see in Figure 2 the multiprocessor architecture used to realize the speech channel, consisting of four I 8085 processors. The task segmentation and realization reflect the basic principle that when solving computation intensive partial tasks we support and relieve the burden on the multiprocessor structure by using fast special purpose hardware elements. For example, the SOM detector is a correlator with highly integrated memories. The A/D and D/A converters and the "A" characteristic compander/expander are placed on a single PCM codec chip, as is the SC technology channel filter.

The entire PCM channel unit is placed on three double and one simple "Europa" cards. The four I 8085 processors are placed on two double cards with the same structure, the special hardware elements can be found on one double card, and the simple card has the PCM codec and the filter circuits. The power requirement is about 20 Watts.

## 6. Conclusions

It can be seen from the microprocessor structure chosen that this architecture can easily accept the expansions necessary to solve future tasks. According to the tests done on the prototype completed the unit satisfies the INTELSAT/INTERCART specification, it makes possible good quality speech transmission in the speech channel and it is suitable for data transmission at a maximum speed of 4,800 bps and for multiplex teletype transmission adopted secondarily to a speech channel.

### BIOGRAPHICAL NOTES

Erno Bacs graduated from the instruments and control technology section of the Budapest Technical University in 1974. He has been working at the Telecommunications Research Institute since. His professional interests extend to hardware and software questions of microprocessor systems and to error detection in digital circuits.

Mihaly Gubanyi completed his studies at the Electrical Engineering School of the Budapest Technical University between 1952 and 1957. Between 1957 and 1964 he worked as a group leading engineer at the Budapest Television Station of the Radio and Television Technical Directorate of the Post Office. Between 1964 and 1970 he worked in the Postal Experimental Institute as a theme chief

for research work connected with introduction of domestic color television transmissions. Since 1970 he has participated in development of data transmission equipment at the TKI. Since 1982 he has been working on development of the INTERCSAT equipment at the TKI.

Lajos Hanzo graduated from the communications engineering section of the Budapest Technical University in 1976. His diploma plan won a third prize and his TDK thesis won a first prize. Since then he has been a scientific worker at the TKI. In 1980 he worked for a year at the Erlangen University (FRG). In 1982 he obtained his special engineering diploma and in 1983 his university doctorate. In 1984 he was awarded the Pollak-Virag prize. His professional interests are signal processing and system technology problems connected with information transmission.

Laszlo Hinsenkamp graduated from the communications engineering section of the Budapest Technical University in 1970. He worked in the Microwave Communications Engineering Faculty of the Budapest Technical University for 3 years and since then has worked at the Telecommunications Research Institute. He obtained his special engineering diploma in 1974. In 1983 he had a 3 month scholarship to the Bochum (FRG) university. Since 1984 he has had an additional job as assistant professor in the Circuits Department of the Communications Engineering Electronics Institute of the Budapest Technical University. His professional interests extend to systems technology problems connected with digital communications.

#### FIGURE CAPTIONS AND KEYS

Figure 1. Specification of the Tasks of a PCM Channel Unit; a. The Prescribed Frame Structure; b. Functional Structure of the PCM Channel Unit

Key:

- |                            |                                     |
|----------------------------|-------------------------------------|
| 1. Frame                   | 6. Speech detector                  |
| 2. Carrier synchronization | 7. Synchronization signal generator |
| 3. Bit synchronization     | 8. Speech level regulator           |
| 4. Data                    | 9. Synchronism detector             |
| 5. Speech                  | 10. Phase status decoder            |

Figure 2. Multiprocessor Realization of the PCM Channel Unit

Key:

- |                        |            |
|------------------------|------------|
| 1. Priority logic      | 3. Decoder |
| 2. Test status control | 4. Speech  |

8984

CS0: 2502/45



BRAZIL

ITAMARATY SEEKS TO DELAY SODRE-SHULTZ TALKS

Technical Meeting Among Delegates Proposed

PY010145 Rio de Janeiro O GLOBO in Portuguese 30 Jun 86 p 17

[Text] Brasília -- If everything goes according to Itamaraty's plan at the 2 July meeting in Paris, Foreign Minister Abreu Sodre and U.S. Secretary of State George Shultz will not be meeting in the near future to reach an agreement on the law reserving the Brazilian computer market for Brazilian-made products. Itamaraty has proposed a technical meeting among Brazilian and American delegates to avoid a decisive political meeting on the disagreements between the two countries.

The strategy was approved by President Jose Sarney who decided to exclude from the Brazilian delegation -- which left last night for Paris -- the representatives of the Communications Ministry and the Industry and Commerce Ministry because their respective ministers, Antonio Carlos Magalhaes and Jose Hugo Castelo Branco, are in favor of making the law more flexible. Science and Technology Minister Renato Archer was not surprised by the exclusion of the representatives from these two ministries because, in his opinion, "they should not take part in these discussions."

Only representatives of Itamaraty (two), of the Science and Technology Ministry (two), of the Finance Ministry (one), and of the Planning Ministry (one) have gone to Paris. Only the representatives of Itamaraty and of the Science and Technology Ministry will be directly involved in the informatics talks. The other two representatives, Ricardo Saur (Finance), and Paulo Tafner (Planning), will center their attention on issues other than Brazilian-U.S. trade. The Brazilian Government seeks to block the U.S. Government's strategy of concentrating its artillery on the Informatics Law to exact concessions in other areas.

The public disclosure of disagreements between Ministers Archer and Magalhaes will not bring any changes to the instructions imparted by President Sarney to the Brazilian delegation during a meeting held on 27 June.

This last weekend, Archer met twice with Brazilian Democratic Mobilization Party President Ulysses Guimaraes to explain his reaction to Magalhaes' criticism. During a meeting held yesterday, Archer also gave explanations to Foreign Minister Sodre, who gave him his full support.

Informatics Delegation Leaves

PY301454 Brasilia Radio Nacional da Amazonia Network in Portuguese 1000 GMT 30 Jun 86

[Excerpt] The Brazilian delegation which will discuss informatics in Paris left last night. It will meet the U.S. delegation on 2 July. The Brazilian delegation is headed by Foreign Minister Secretary General Ambassador Paulo Tarso Flecha de Lima and made up of experts from the Science and Technology, Industry and Commerce, Planning, Finance, and Communications Ministries, as well as representatives of the Banco de Brazil Foreign Trade Department (CACEX) and the National Security Council. The Paris meeting was decided upon during U.S. Under Secretary of State John Whitehead's visit to Brazil. It will be the first round of negotiations on the U.S.-Brazilian trade dispute.

/6091

CSO: 5500/2062

18 July 1986

CUBA

## INCREASED TV PROGRAMMING FOR EIGHT PROVINCES

Havana GRANMA in Spanish 15 Apr 86 p 1

[Article by Rosa Elvira Pelaez]

[Text] Five provincial television stations will be opened on 16 April, a very significant date for Cuba. Tomorrow programming will begin with the corresponding identification in Holguin (Tele Cristal), Pinar del Rio (Tele Pinar), Villa Clara (Cubanacan TV), Camaguey (TV Camaguey), and Santiago de Cuba (Tele Turquino).

Sergio Corrieri, first vice-president of the Cuban Institute of Radio and Television (ICRT), informed the press that soon two more stations will begin broadcasting in Guantanamo and the Isle of Youth.

The "Contacto" program, to be broadcast on Tele Rebelde this Wednesday, will be devoted to the topic of these new stations and what they mean for the development of television in our country.

The news linkage with "Revista de la Manana" [Morning Magazine], news programs and bulletins will be maintained, but the stations will broadcast their own programs from 1330 to 1900 hours, using the signal of the Tele Rebelde National Channel.

Between these hours, Tele Rebelde will not have any programming. As time goes on, Corrieri explained, other possible schedules will be studied.

These television stations have emerged from Tele Rebelde, and have complete independence to develop their own programs, including dramas.

Provincial television, which can only be received locally, meets the interests of the province. Through special agreements, the central agency may commission certain programs from specific stations, or may broadcast nationwide some programs whose particular characteristics and values warrant it. Efforts are also being made to encourage the different stations to exchange programs among themselves.

8926

CSO: 5500/2052

REGIONAL AFFAIRS

BRIEFS

GULF STATES TV COORDINATION MEETING--Information Minister Tariq 'abd al-Rahman al-Mu'ayyad at 0830 today met at his office with the delegations of the member states of the GCC television joint program who are participating in the coordination meeting on the use of the frequency range 790 to 862 mhz, which began today. The information minister welcomed the delegations participating in the meeting and lauded the efforts of the Gulf television joint program with regard to television programs and technical and engineering coordination among member states. Such coordination has benefitted users of communications channels in the Arabian Gulf. Khalil Ibrahim al-Dhawadi, assistant under secretary for radio and television at the Information Ministry, and Hala al-'Umrani, director of television, attended the meeting. The coordination meeting is attended by delegations from the UAE, Saudi Arabia, Iraq, Oman, Kuwait, Bahrain, and the GCC's Technical Office for Communications. [Text] [Manama WAKH in Arabic 1030 GMT 16 Jun 86 GF] /6662

CSO: 5500/4508

AFGHANISTAN

TEHRAN CHARGES MOSCOW CONTROLS DRA MEDIA

Ld221714 Tehran Domestic Service in Persian 1630 GMT 21 May 86

[Text] Afghanistan's television has become a part of a radio and television organization under the supervision of the USSR. Therefore, the Soviet Government from now on will be in full control of the radio and television programs of Afghanistan. With this project, programs that will be prepared in Moscow will be relayed via satellite throughout Afghanistan. In order to advance this project, up to now six television transmitter stations have been set up in Ghazni, Jalalabad, Gandahar, Herat and Badakhshan.

IRNA, which reported this, added: At present, the programs of Afghanistan's television are prepared in Kabul and are then relayed via satellite to Moscow for approval.

/7051

CSO: 4640/366

18 July 1986

INDIA

## REPORTAGE ON OPERATION OF INDIAN SATELLITES

## Way Paved for Telecom Expansion

New Delhi PATRIOT in English 2 Jun 86 p 5

[Text]

The successful operation of the "INSAT-1B" satellite since 1 October 1983 has paved the way for substantial augmentation and expansion of telecommunication services during the Seventh Plan, reports UNI.

Although two more satellites in the INSAT-1 series remain to be launched—INSAT-1C in the last quarter of 1986 and INSAT-1D sometime in 1988-89 when INSAT-1B will have largely outlived its life—action has already been initiated with regard to the INSAT-II series.

The INSAT-II series of satellites are expected to be operational by early 1990-s and the expenses on their space segment will be borne equally by the three user ministries—the Ministry of Communications, the Ministry of Information and Broadcasting and the Ministry of Science and Technology, according to Mr G K Gupta, deputy director-general (satellites) in the Department of Telecommunications.

The test spacecraft for the INSAT-II series is scheduled to be launched by 1989-90.

The satellite communication technology has now become an integral part of the long distance transmission media in India alongwith other terrestrial media like the co-axial and the microwave systems as is evident from

the fact that by the end of the Sixth Plan as many as 32 earth stations, four of them transportable, were available with the department of telecommunications (DOT).

The spill-overs of the sixth Plan includes the installation of multiplex and associated equipment for full utilisation of the telecommunication capacity of 3956 circuits planned as a part of the INSAT-IB network, installation and commissioning of four additional earth stations (at Delhi, Bombay, Calcutta and Madras) to form part of INSAT-IC, and installation of multiplex and associated equipment for utilising the additional 1954 circuits, also to form part of INSAT-IC.

The geo-stationary orbit (GSO) of INSAT-IC will be located at 93.5 degrees east—19.5 degrees away from INSAT-IB which is located at 74 degrees east. INSAT-ID which is to replace INSAT-IB will have its GSO located somewhere between INSAT-IB and INSAT-ID, according to Mr Gupta.

The four earth stations in Delhi, Bombay, Calcutta and Madras are expected to be ready for operation towards the end of this year when the delayed INSAT-IC is expected to be put into orbit.

The department of telecommunications has drawn up a tentative programme for utilising the additional circuits which will be available from a successful launch of the INSAT-IC. According to this programme 500 circuits will be utilised during the first six months after INSAT-IC became operational, progressively 2492 circuits will have been utilised over the succeeding 30 months.

Efforts are being made to provide at least 20 more small transportable earth stations which can be moved to any part of the country by road or some of them even by air to remote areas where normal reliable communication does not exist or to areas cut off by storms, floods or other natural calamities.

The project for 10 such transportable earth stations having been approved already are now expected to be available before the close of the current financial year. The remaining 10 stations

would be provided during the current Plan period.

According to Mr Gupta, the availability of the transportable communication terminals for uplinking telecommunication services from any part of the country can be increased depending on the requirements of the television network.

A special project envisages setting up of another 26 fixed earth stations mainly covering some of the district headquarters and some border areas during the Seventh Plan.

The following are the other salient features of the Seventh Plan satellite communication projects:

- Provision of the Demand Assigned Multiple Access (DAMA) facility at new earth stations to ensure optimum utilisation of the single channel per carrier (SCPC) space segment.

- Augmentation of the existing remote earth stations at places like Guwahati, Agartala, Imphal and Port-Blair.

- Providing an earth station

at Bangalore to form part of the Doordarshan project for television uplink facility.

The satellite planning cell of the Department of Telecommunications is handling "in a big way" a large number of contributory works for the requirements of other Government departments like defence, All India Radio and Meteorology as also the requirements of the public and private sectors including the press.

Suitable "business communication policy" has since been formulated to provide such services. The policy, according to Mr Gupta, envisages various situations pertaining to installation, commissioning, operation and maintenance of such networks.

The DOT is presently engaged with the engineering and detailed system planning of the Satellite based networks in respect of demands from at least 11 public and private sector organisations including one English daily and a national news agency.

### Possible Launching Problems

Bombay THE TIMES OF INDIA in English 2 Jun 86 p 14

[Text]

NEW DELHI, June 1 (PTI):

**H**OPES of launching Indian satellite INSAT-IC this have become dim with the failure of the European rocket Ariane-2, yesterday.

Ariane launcher was one of the options Indian space department had kept open for putting INSAT-IC in orbit after the explosion of the U.S. Challenger four months ago. This option is also now ruled out.

Though Ariane had been booked for the next two years, the French Aero-spatiale had hoped to accommodate INSAT-IC, but yesterday's failure, is expected to delay future launchings of Ariane.

### STAND-BY SATELLITE

INSAT 1-C is supposed to be a stand-by for INSAT 1-B operating for the last four years. Its designed life time is five years.

Space department sources said that the continuity of the INSAT programme will be threatened if a replacement for INSAT 1-B was not placed in orbit before its life expiry.

India has signed a contract with the U.S. National and Aeronautics and Space Administration (NASA) under which NASA will launch the satellite using its space shuttle or one of its expendable launch vehicles such as the Delta rocket.

The blast in space shuttle Challenger in flight, followed within a month by the explosion of a Delta rocket on the launch-pad put the INSAT programme in jeopardy and the Indian space department had been hoping to launch INSAT 1-C using the European space agency's launch vehicle Ariane.

#### FEAR OF SLOT LOSS

India is in a hurry to launch INSAT 1-C not because the existing INSAT 1-B is in immediate danger of running out of power, but because India may lose its claim to the assigned space slot if it fails to occupy it before 1986.

The World Telecommunications Union had assigned two slots for India over the Indian Ocean one of which is occupied by INSAT 1-B and the other at 94 degrees east longitude by the non-functional INSAT 1-A launched in 1981.

INSAT 1-C is supposed to be parked at the 94 degree slot adjacent to INSAT

1-A. If this slot is not occupied by India before 1986, other countries can claim the slot, according to informed sources.

#### U.S.S.R. PLANS

PARIS, (AFP): As the West licks its wounds after a series of setbacks in space, the Soviet Union is quietly and apparently successfully moving ahead with its space programme.

The destruction of the Ariane rocket shortly after take-off from Kourou, French Guiana, along with the telecommunications satellite it had been due to launch, leaves the Soviet Union as the only country still launching satellites.

China is looking for foreign customers for a launch programme — only Sweden has accepted so far — and a Japanese project is still at the drawing-board stage.

As far as information available in the West shows, the Soviets have had no problems with their various rocket launchers.

/9317

CSO: 5550/0134



INDIA

## DELHI REPORTEDLY SCRAPS PLAN FOR TELECOM IMPORT

New Delhi PATRIOT in English 1 Jun 86 p 5

[Text]

**Bangalore May 31**—A decision to discard proposals to import telecommunications equipment at high cost during the Seventh Plan period and concentrate all efforts to utilise available indigenous and foreign technology already acquired by the country has reportedly been taken at the highest level at the Centre.

Sources here are interpreting this as a big setback to the pro-import lobby in the Department of Telecommunications (DOT) which has been pressing for the import of equipment worth Rs 600 crores during the Seventh Plan despite the fact that the Indian Telephone Industries (ITI) is capable of producing the equipment.

A controversy has also been raging between the ITI and DOT regarding the setting up of the electronic switching system unit

number two (ESS—II) at the ITI complex at Bangalore for the past few months.

ITI chairman and the board of directors have been pressing for an early decision on setting up of ESS-II which was approved by the Government in 1983.

Due to the phasing out of production of crossbar and stowager equipment almost 10,000 ITI workers at Bangalore have been rendered jobless.

But DOT directors have been raising various objections and putting forward the excuse of resources constraint.

These directors, while pleading for non-availability of funds, were however, in favour of importing the equipment from foreign countries which would cost the country valuable foreign exchange.

A decision on this issue is expected to emerge soon and in all

probability, 17 will be a green signal for setting up of the ESS-II at Bangalore.

**Exchange opens:** An integrated local-cum-trunk exchange (ILT), with 512 lines, the first of its type, has been inaugurated today in the rural industrial setting at Hebbagodi, 20 kms from here.

Though the first such exchange, on lab experimental basis, was set up at Udumyampoor in Kerala in July, 1984, with 128 lines, the Hebbagodi exchange is the most modern digital exchange using microprocessors for control and providing clear speech communication using digital techniques.

The digital exchange has been fully developed, fabricated and manufactured by the ITI, Bangalore, with a provision to increase its capacity to 2,000 lines.

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CSO: 5550/0132

INDIA

## ADVANTAGES OF INDIGENOUS DIGITAL SWITCHING TECHNOLOGY

Bombay THE TIMES OF INDIA in English 2 Jun 86 p 4

[Text]

NEW DELHI, June 1 (PTI).

**T**HE 1.1-million persons waiting for telephones can get connections in a short time if the Post and telegraph department permits indigenous technology of electronic digital PABX (private automatic branch exchange), to be used as a co-operative exchange.

With this technology developed by the Centre for development of telecommunications (C-DOT), several more connections can be given without expanding the existing number of telephone lines. But, the call handling capacity of the exchange has to be augmented, according to Dr. D. R. Mahajan, director, C-DOT.

To serve 100 people, the PABX costing Rs. two lakhs needs ten telephone lines, he said and added that an individual metering system built into the PABX would enable a check over the bills.

Such a PABX was suitable for group housing societies having 100 or more flats which could be served round-the-clock if it was manned in four shifts for incoming calls, Mr. Mahajan said.

The initial cost may be about Rs. 3,000 per head, and the rest of the maintenance costs could be shared by the 100 people using telephone extension services, plus the cost of individual calls, he said.

Out of 10 lines, if one or two or more were faulty due to rains or otherwise, the PABX could serve all the 100 extensions.

On the lines of "own your telephone," now the concept of "own

your telephone exchange" could be promoted in rural areas as the C-DOT has also developed rural automatic exchange (RAX).

This idea was also mooted way back in 1952, but the equipment was not available then, Mr. Mahajan added.

In villages the idea of co-operative telephone exchanges could be promoted if about 100 people were willing to subscribe to it. Even panchayats could opt for it, Mr. Mahajan said.

The salient features of the electronic RAX system was that STD (straight trunk dialling) and international call facilities were also available.

The field trial of a prototype 100-line RAX was successfully going on at Kittoor (Karnataka). Three other models suitable for different climatic conditions would be tested at Osian (Jodhpur), Charcharoli (Yamunanagar) and Hiji (Kharagpur).

The C-DOT has a mandate to develop the full range of exchange systems from 200 lines to 20,000 lines. The 500-line exchange would be ready by December this year.

The PABX technology has already been transferred to 48 manufacturers, including four state electronic corporations of Rajasthan, Kerala, Himachal Pradesh and Bihar, which also have licence to manufacture RAX equipment.

The spirit behind all these developments is Mr. Satyen Pitroda, 43, a non-resident Indian, who is proud of the Indian talent and his team of young engineers.

/9317

CSO: 5550/0133

INDIA

## COUNTRY'S SECOND INDIGENOUS EXCHANGE INSTALLED

New Delhi PATRIOT in English 3 Jun 86 p 5

[Text]

An integrated local-cum-trunk exchange (ILT), jointly developed by the Indian Telephone Industries (ITI) and the Telecommunications Research Centre of the Department of Telecommunications (DOT) has been commissioned at Hebbagodi, a rural area in Bangalore district of Karnataka, reports PTI.

This is the first exchange of its type to be connected to the DOT network in Karnataka and the second in the country, the first having been installed at Udayamperoor, Ernakulam, an official press release in New Delhi on Monday said.

This 512-line exchange will help the subscribers of Hebbagodi to get quick access to the telecommunication network of Bangalore, it said.

A modern digital exchange, the ILT has been specially designed to serve economically the low capacity rural exchange requirements of the DOT.

Being a local-cum-trunk exchange,

any STD station in the country could be connected to it, the press release said. It could handle high call traffic and push button telephones are being added to facilitate quick dialling.

The exchange can work as a transit exchange so that nearby areas can at a future date be connected through ILT.

The exchange has a special feature of "non-blocking" to prevent any congestion within the exchange. In a local call a busy tone is given only if the called subscriber is actually busy, the press release said.

Some other unique features of this exchange are: call waiting, hotline, malicious call trace, easy STD barring, and facility to ring back when free.

The exchange, the press release said, represented the first of the series of products resulting from the joint efforts of ITI and TRC to meet integrated services digital network plan of the Department of Telecommunications.

/9317

CSO: 5550/0135

INDIA

## FIRST DIGITAL SWITCHING SYSTEM FACTORY IN OPERATION

New Delhi PATRIOT in English 20 May 86 p 5

[Text]

The country's first Rs 180-crore digital electronic switching system factory in the backward area of Mankapur in eastern Uttar Pradesh has come out of teething trouble and is well on way to achieving its set capacity of five lakh exchange lines by 1989-90, report agencies.

The unit, a wing of the state-owned Indian Telephone Industries (ITI), has already produced 28,000 lines worth Rs 28 crore, after it entered the first phase of assembly last year. It proposed to produce 1.20 lakh lines values at over Rs 100 crore during 1986-87, its chairman and managing director K P P Nambiar said.

A party of reporters who visited the factory saw a sea change in remote Mankapur in the Gonda district with the setting up of the massive factory as the barren area had virtually become a modern and industrial township.

The unit has been established in collaboration with CIT-Alcatel, a French firm which is the world's fifth largest manufacturer of telecommunication equipment, to manufacture E 10 B type of digital electronic exchanges, chosen by over 50 countries.

With this factory, the foundation had been laid for digitalisation of the communication network in India, Mr Nambiar told the reporters.

The unit, situated on a 150-hectare land, is also expected to lead India to self-reliance in the field of digital switching manufacture.

Mr Nambiar and Mr S K Khanna, the executive director of the plant, said the factory would start manufacturing critical components like hybrid, relays, transformers, coils and bus-bars from this year.

Efforts were being made to indigenously produce 4000 components, they said.

Mr Nambiar said the factory would achieve 66 per cent indigenisation by 1987-88 and 82 per cent by 1988-89. It would be producing all components excepting the very large integrated circuits which would be obtained from outside or manufactured by ITI itself at its Bangalore factory.

The ITI was in a position to design and manufacture 2.5 to 3 lakh such circuits, he said.

Of the 28,000 lines produced by the factory last year, two exchanges of 10,000 lines each had been supplied to Malleswaran (Bangalore) and Secunderabad (AP) and an 8,000 line exchange to Narayanpur (Ahmedabad), Mr Nambiar said.

Mr Khanna said the hybrid plant and printed circuit board and moulding unit would be ready by this year.

French technicians would visit the plant shortly to instal machinery at the moulding shop, an official who took newsmen around the factory said.

Mr Nambiar said the unit had been set up on the principle of vertical integration where most of the essential components were produced inhouse.

This approach was necessary in view of the infrastructure facility available at the time of conceptualising the project and the fact that since the factory was being set up in a green field area, all critical items had to be planned for inhouse production, he said.

The unit has established an exchange testing platform capable of conducting integration test of 10,000 lines and a model exchange, besides a sophisticated printed card repair centre.

About 1050 employees, including 200 specialists who have undergone advanced technology training in France, are working in the factory which has an employment potential of 3,550, Mr Nambiar said.

A satellite communication link has also been established by the ITI in the Manakpur factory, connecting the remote area to national and international network.

At present this satellite communication is limited to voice communication. But it would be shortly expanded to facsimile and data communication applications, Mr Nambiar said.

The complete assembly plant, main frame computer plant and captive power stations, would also be ready soon, he said.

Sanchar Vihar, a mini-contained township is coming up to accommodate 2,550 employees and their families. About 550 quarters, according to Mr Nambiar, have already been allotted. The township has a school, shopping complex, bank and other public utilities.

In terms of ecological balance of the environment, the ITI is providing an effluent treatment plant and had planted about 10,000 trees and shrubs so far, Mr Nambiar said.

The switching exchange assembly is the largest centre of activity in the plant. It is targetted to produce equipment worth Rs 280 crore per annum on full capacity in 1989-90.

The manufacturing operations involve essentially two types of activity—printed circuit board assemblies and rack wiring. The racks with their cards are duly subjected to a quality test and finally despatched to the consumer.

Mr Nambiar said ITI was thinking of going in for only switching equipment assembly plant as it could save the capital investment by 50 per cent. There were many competent companies which could manufacture components for such plants. A feasibility report had been prepared and approved by the board of directors of ITI, he added.

/9317

CSO: 5550/0131

INDIA

BRIEFS

MORE AUTOMATIC EXCHANGES--Kumbakonam, June 2--The Rs 6-crore project of installing a digital electronic trunk automatic exchange of 2,000 lines capacity at Tiruchi to meet the needs of Tiruchi and Thanjavur revenue districts is the first such project in the south. There is also a proposal to bring 20 more towns on the STD map this year. This was stated by Mr A.V.S. Mani, General Manager, Telecommunications, Madras while giving away outstanding performance awards to 26 employees in Tiruchi division here. Mr Madasami, Divisional Director, who presided, said Kumbakonam exchange would be expanded by 500 lines and Tiruchi by 1200 lines. The exchanges at Nagapattinam, Mayiladutharai, Karaikal, Pudukkottai, Tiruvarur, Mannargudi and Tiruverumbur would soon have by 100 more lines each. [Text] [Madras THE HINDU in English 3 Jun 86 p 12] /9317

DIALLING TO TURKEY--Madras, June 2--International subscriber dialling (ISD) is now available to Turkey with the code '90.' According to a Madras Telephones press release, subscribers of Nungambakkam (47), Flower Bazaar (56), Madhavaram (57), Mambalam-1 (44) and Ambattur (65) exchanges will have the above facility with the dialling format '00-90' followed by the area code and the subscriber's number. Subscribers of Mambalam-II (45) and Harbour-I (51) will have to wait for the second dial tone after dialling '00.' After getting the second dial tone only they have to dial '90' followed by the area code and the subscriber's number. Subscribers of all other exchanges in Madras Telephone district will have to dial '900' and wait for ~~the~~ second dial tone and then dial the code '90' followed by area code and the subscriber's number. [Text] [Madras THE HINDU in English 3 Jun 86 p 12] /9317

CSO: 5550/0136

IRAN

PTT OFFICIAL ANNOUNCES TELEPHONE AVAILABILITY IN FUTURE

Tehran KEYHAN in Persian 17 May 86 pp 1-2.

[Interview with Minister of Post, Telegraph and Telephone Engineer Mohammad Gharazi by the media; date and place not specified]

[Text] In the near future, 200,000 telephones will be distributed annually throughout the country.

Engineer Mohammad Gharazi, the minister of post, telegraph and telephone, announced the above statement in a press, radio and television interview on the occasion of the world anniversary of communication and added: The development of communication is at the top of the agenda of the Iran communication company and efforts are being made to distribute throughout the country in the future, if the necessary resources are available, 200,000 instead of 100,000 telephones.

He then announced the communication company's programs for this year as follows:

Communication channels to 450 villages, the installation and operation of 42 microwave stations, the development and replacement of 269 teletype machines, the installation and completion of 92,000 telephones, the installation of 5,000 semi-electronic telephones and a 2,000-telephone center, the installation of 1,900 public phones throughout the country, and carrying out the technical programs for the development of communications systems.

Engineer Gharazi said: Last year, 88,000 telephones were installed and 125,000 telephones were put into operation. In order to ultimately respond to the communication needs of the people, the communications company must increase the existing 1.5 million telephones to 4 million.

The minister of post, telegraph and telephone added: Today, the Islamic Republic of Iran, with all its existing resources, including the use of the international communication resources of the satellites of the Atlantic and India Oceans, can have two-way communications with all the countries of the world.

He said: The international communications union was established 121 years ago (1244 solar [1865]) and 4 years later, Iran became a member of this very old union.

In connection with the importance of communication in developed societies, Engineer Gharazi said: In addition to the importance and the influence of communications on political, informational and social issues, these resources play a very important role in the advancement of economic and production affairs, so that 10 percent of the gross national product stems from them.

He said: Once every five years, the general assembly of the world communications union is held, with the participation of the ministers of communication of the member countries, in which the procedures for the distribution of resources, the prevention of communications airway transgressions and the use of communications technology throughout the world are discussed.

10,000

CSO: 4640/325



IRAN

BRIEFS

NEW TV, RADIO TRANSMITTERS--On the occasion of Al-Quds day a 50 kw transmitter, called Jerusalem Radio Transmitter, began its operation as of this morning in Urumiyeh. The center, consisting of one main 50 kw transmitter and one 10 kw spare transmitter, was made operational by Iranian technicians. The transmitter broadcasts the first network's programs as well as local productions on 935 metre medium wave for west Azarbayjan, north-west regions as well as border areas of neighboring countries. According to the central news unit from Urumiyeh, in addition to the aforementioned transmitter, a powerful television transmitter also became operational within the network of towhid television has a 70 kw signal. It broadcasts the second network of the Vision of the Islamic Republic programs on channel 11 for the inhabitants of towns and villages in the north of west Azerbayjan. [Text] [Tehran Domestic Service in Persian 1630 GMT 6 Jun 86 LD] /7051

TRANSMITTER COMMISSIONED--A new 300-watt FM radio transmitter was installed in Gav Bandi District in the Lengeh environs. Now the district residents and neighboring villages will be able to hear the programs of the Voice of the Islamic Republic of Iran on the frequency of 107.9 mhz on FM. [Summary] [Bandar 'Abbas Domestic Service in Persian 1330 GMT 14 Jun 86 GF] /7051

CSO: 5500/4376

PAKISTAN

BRIEFS

RADIO STATION IN GILGIT--At the demand of the people living in the northern regions, a 10-kilowatt radio station has begun operations at Gilgit, according to the station director of Radio Pakistan, Mr Muhammad Akram Khan. He said the broadcasts from this station will be heard in all the northern areas. This will meet the demands of residents there. Aerial masts are being erected for the new station at a cost of 119,000 rupees. The rest of the job will be completed in the next financial year. Welcoming the opening of the 10-kilowatt radio station, the councilors and general public of the northern regions have expressed the hope that the broadcasting house will in due course be shifted from Dinar to Gilgit. This will remove difficulties of the general public in receiving the radio station. [Text] [Lahore JANG in Urdu 22 Jun 86 p 2 GF] /12232

CSO: 5500/4737

GHANA

BRIEFS

FM RADIO STATION--A € 1.6 million V.H.F. FM transmitter and Studio equipment donated by the Federal Republic of Germany to the GBC were commissioned by the Secretary for Information, Mr. Totobi Quakyi in Accra on Wednesday. The 500 watt transmitter and equipment were officially handed over to the GBC by the West German Ambassador. Mr. Vogel at a ceremony at the Broadcasting House. The mono transmitter will serve Accra-Tema Metropolitan Area within a radius of 50 kilometres. In an address the Secretary for Information, Mr. Totoby Quakyi said the installation of the equipment is another step towards the development of community radio network in the country. Its programme will be designed to suit specific local conditions and requirement. He mentioned that in a few weeks time another station will be commissioned in Bolgatanga and within a few weeks the government will be taking delivery of more equipment from UNESCO for the Apam relay station to be followed shortly with another equipment for Dormas-Ahenkro, Kete-Krachi and Keta stations. According to the Secretary, the rediffusion network will be replaced by community radio facilities and it will necessitate the production of more radio sets which will meet the demand of every pocket. He thanked the German government for the gift. [Text][Accra PEOPLE'S DAILY GRAPHIC in English 23 May 86 p 8]/12828

CSO: 5500/56

LIBERIA

BRIEFS

RADIO ELWA RESUMES BROADCASTS--The management of the Catholic Community Radio, ELCM, in Monrovia, has announced that the station will resume normal broadcast next Monday, 23 June. An ELCM release said it will operate from 1800 to 2400 each day. The station has been off the air since 1 April this year for financial as well as other reasons so far not disclosed. [Text] [Monrovia Radio ELWA in English 0655 GMT 20 Jun 86 AB] /12913

CSO: 5500/86

NIGERIA

MINISTER ON PRIVATE RADIO COMMUNICATIONS EQUIPMENT

AB172205 Lagos Domestic Service in English 2100 GMT 17 Jun 86

[Text] The Federal Government has suspended the issuance of new licenses for private radio communications equipment, pending the review of existing ones. This is to ensure that licenses are issued for services only in areas where the public telecommunications facilities are either nonexistent or unreliable.

The minister of communications, Colonel Tanko Ayuba, who announced this in a press briefing in Lagos, stated that a register of licenses to private radio stations had been prepared and was being updated with the aid of computerized frequency registry. He disclosed that at present, there were about 14,000 private radio communications licenses of all categories, including the high frequency, very high frequency, and ultra high frequency.

Col Ayuba said his ministry collected 2.4 million naira between August 1985 and March this year from existing licenses. He noted that the tariff was, however, being reviewed to reflect the reality of present-day situations.

The minister pointed out that after the inspection of 46 private radio equipment users, 11 illegal ones were immobilized, while 23 were cautioned for frequency irregularity; 4 equipment [as heard] were impounded for nonconformity with the technical standards.

/12232  
CSO: 5500/85

NIGERIA

MINISTER DISCUSSES PHASE OUT OF DOMESTIC SATELLITE SYSTEM

AB162052 Lagos Domestic Service in English 1800 GMT 16 Jun 86

[Text] The Domestic Satellite Communication System [Domstat] is being gradually phased out in the country. This followed some inherent problems identified in its functions. Communications Minister Colonel Aliu Tanko Ayuba disclosed this in Lagos today while briefing newsmen on the activities of the ministry. Chika Emerewa has more on the briefing.

[Emerewa] The Domestic Satellite Communication System, Domstat, was introduced in the country's communications network in 1975 primarily to provide television coverage of the world black festival of arts, known as Festac-77. Apparently, because of the urgency at that time, the (?off-the-shelf) American standard equipment, which had a life span of 15 years, were procured and installed. At the end of the event, the system was expanded and now serves the entire nation for the transmission of television network programs, point-to-point telephone, telex and low-speed data service. Colonel Ayuba explained that one of the problems of the Domstat system was nonconfirmation of its power supply to its stations with the Nigerian standards, a situation which adversely affected its operational performance from time to time.

In addition, the Domstat technology was fast developing, culminating in the obsolescence of the existing system. The minister said that in the wake of its gradual phase-out, the Ikoyi outstation would be relocated in a more suitable site while redundancy and back-up system would be added to all [word indistinct] of systems with a view to improving their gradual general reliability and performance of the system. He also enumerated the problems facing the expansion of some of the existing exchanges; for instance, limitation of space in the Odola-Mijun (?cross) required to meet the phase of transmission project.

However, the minister stated that negotiations for the installation of digital exchanges, which required reduced space, had reached advanced stage. They would be installed at Lagos primary center, Idore, Ikeja, Bodija in Ibadan, Ilorin, Kano, Maiduguri and Bauchi to provide 85,000 trunk lines. But because of the high demands for telephone lines, Colonel Ayuba said that the proposal was being (?varied) to provide a total of 120 lines. The minister also spoke of the installation of telephone booths in strategic locations in parts of the country. [passage indistinct]

Colonel Ayuba said that his ministry viewed with serious concern the problems of delay in dispatching bills to customers, a situation which resulted from inadequate billing facilities. The management of Nitel [Nigeria Telecommunications Limited], he said, has been directed to provide billing computers in all the five zonal headquarters to ensure prompt dispatch of bills. In the meantime, Nitel is being owed over 200 million naira by subscribers throughout the country. The minister stated that the installation of telephone services in the rural areas had no political undertone, but was rather based on the commercial viability of the areas some of which had government projects and were mineral producing areas.

/12232

CSO: 5500/84

SOUTH AFRICA

BRIEFS

SABC SAYS FM FREQUENCIES MUST CHANGE--The SABC has announced that its FM radio broadcast frequencies are to change. This is a result of the decision by the International Telecommunications Union which controls activities worldwide, that countries in Africa and parts of Europe have to change their FM frequencies to conform to international standards. The SABC says the changes will be made systematically on a regional basis beginning next month. The changes should be completed by July next year. [Text] [Johannesburg Television Service in English 1800 GMT 14 Jun 86 MB] /12232

CSO: 5500/85



TANZANIA

RADIO TANZANIA, BROVERI SIGN TRANSMITTER PACT

Dar es Salaam DAILY NEWS in English 22 May 86 p 3

[Excerpt]

RADIO Tanzania Dar es Salaam (RTD) yesterday signed a 30m/- contract with a Swiss radio manufacturing company, Brown Broveri, for the supply of two units of 100 kilowatts each short-wave transmitter.

The contract was signed by the RTD Director, Ndugu David Wakati, and Brown Broveri representative for East Africa, Mr. Wolfgang Michalski.

The contract includes the supervision of installation and commissioning of the equipment while RTD engineers will carry out the installation work.

A factory training programme for two engineers is also part of the contract.

Under the contract, the equipment will be delivered 12 months after the Swiss company receives a 20 per cent down payment.

The Bank of Tanzania has already agreed to provide foreign exchange for the purchase of the two transmitters. This will be the starting of the second

phase of RTD's rehabilitation programme aimed at replacing old transmitters.

Parties submitted tenders to the Central Tender Board for the supply of equipment and supervision of their installation. The tenders were from Yugoslavia, Japan, France, United States, and Federal Republic of German.

Meanwhile, radio programme officers and script writers for the Family Life Education Programme (FLEP) will hold a seminar in Dar es Salaam next week during which they will review the organisation's activities since its formation in 1979.

/9274  
CSO: 5500/83

TANZANIA

BRIEFS

TV TRANSMISSIONS TO PEMBA--Television viewers in Pemba shall shortly be able to tune in transmissions from Television Zanzibar (TVZ) main studios at Karume House here following the completion of equipment in Zanzibar and installation of a new receiver in Pemba. TVZ Director, Ndugu Abdallah Mwinyi, said at the weekend that the work, earlier planned to take six weeks, was completed last week, two weeks ahead of schedule. TVZ suspended all transmissions on April 24, this year, to allow three engineers from West Germany and a team of TVZ technicians overhaul the transmitter at Masingini in Zanzibar and fix in place a new dual receiver at Mkwajuni in Pemba. Transmissions resumed for the Zanzibar island ten days ago after repairs on the Masingini transmitter were completed. [Text] [Dar es Salaam DAILY NEWS in English 26 May 86 p 5] /9274

AIRPORT EQUIPMENT REHABILITATION--The Directorate Civil Aviation (DCA) intends to rehabilitate the Kilimanjaro International Airport (KIA) telecommunications equipment to improve efficiency. A DCA spokesman told Shihata in Dar es Salaam yesterday that the project, to cost 100m/-, would involve repairing and replacing of all underground communications and signal cables on the airport linking tower equipment room, communications antennas and feeders. The rehabilitation programme will also include supplying, installing and commissioning of new very high frequency (VHF) transmitters and receivers and other aeronautical telecommunications equipment, the spokesman said. He said a two-man delegation from a Federal Republic of Germany firm (SEL) was expected in the country next month to carry out feasibility study for the project. The telecommunications equipment at KIA were installed in 1971. [Text] [Dar es Salaam DAILY NEWS in English 24 May 86 p 1] /9274

CSO: 5500/82

UGANDA

BRIEFS

RADIO LINK WITH UK--Negotiations are underway between Uganda Airlines and a British radio communication equipment supplying firm to restore direct contact between Kampala and London. This was revealed this week by Mr Peter Musitwa, sales co-ordinator of Etesas Limited, representatives of AEL Communications Ltd. The AEL Manager for Africa Region, Mr John E. Longhust, was recently in Uganda for talks with Airlines officials. AEL radio communication system is used by the Bank of Uganda, Police, Red Cross and oil companies. Besides business communication, the company's equipment can be used to fight fire and burglary by transmitting alarm signals to Police Stations. Established 20 years ago at Surrey near Gatwick Airport in England, AEL has provided radio systems to customers in 70 countries. Its representatives in Uganda began operating in 1980. [Text] [Kampala THE NEW VISION in English 16 Apr 86 p 3] /9274

CSO: 5500/80

FRANCE

# INDUSTRY MINISTRY REGAINS CONTROL OF ELECTRONICS

Paris LA TRIBUNE DE L'ECONOMIE in French 28 Apr 86 p 7

[Article by P. D. E: "It's Official: The Electronics Sector Goes Back Under Industry' Wing"]

[Text] A jurisdictional decree published in the JOURNAL OFFICIEL of Saturday 26 April, announces that the electronics sector is now assigned to the Ministry of Industry, Mails, Telecommunications, and Tourism. It had been under the jurisdiction of PTT since July 1983, when Mr Mexandeau, wishing to underscore the complementary nature of computers and telecommunications, had obtained it in return for using his budget to finance advanced technologies in this sector.

The decision does not come as a surprise. Immediately upon assuming his functions, the day after the 16 March elections, Gerard Longuet, the new secretary of state for PTT, had opened the issue by stating that his services should focus on their essential purpose--service, and that since he could not be "both judge and judged," he believed it desirable for PTT to disengage from industrial responsibilities in electronics, computers, space, and telecommunications.

## Clear Position

By the same token, last Saturday's decree lifts the uncertainty covering the future of telebroadcasting's (TDF) guardianship. Since the arrival of the new government, one might have thought for a while that TDF could become the responsibility of Mr Longuet's friend and colleague, Francois Leotard, minister of culture and communication. The possibility was made the more plausible by the fact that the Ministry of PTT--now state secretariat--had lost the third T for telebroadcasting, to remain only P and T. The TDF guardianship finally remains with Mr Longuet; it is in fact a co-jurisdiction, since frequency assignment becomes the responsibility of Culture.

For the electronics sector, Mr Longuet's position is clear: his state secretariat cannot at the same time be both customer and supplier of telecommunications equipment, especially since PTT's autonomous budget was tapped significantly--about 2 billion francs per year--in order to patch the state deficit since 1982, when this practice started.

"My predecessors were not concerned with the market, whereas my action will be guided by the needs of customers and price accuracy," Mr Longuet recently said, noting also the "abnormal" financial transactions from the PTT supplementary budget to the state budget: 2.8 billion in 1982, 2.4 billion in 1983, 8.4 billion in 1984, 18 billion in 1985, and 20.3 billion in 1986.

From these amounts, the PTT financing of the electronics sector had reached 400 billion in 1983, 3.4 billion in 1984, 6.5 billion in 1985, and 5 billion in 1986, without including 3.3 billion in 1985, and 4.3 billion in 1986 from CNES, nor the 500 million in 1986 from the "computers for all" plan.

The PTT undoubtedly has the reputation of being rich, but for a liberal like Mr Longuet these transfers are "perverse." As things stand, one can believe that he wants to have a free hand in case of an always possible "deregulation" of telecommunications. The ball is therefore in Mr Madelin court for financing the electronics sector.

11,023

CSO: 5500/2683

FRANCE

AUDIOVISUAL BILL DETAILS REVEALED

Paris LE QUOTIDIEN DE PARIS in French 7 May 86 p 7

[Article by Jean-Paul Mulot]

[Text] LE QUOTIDIEN has published below the principal articles of the draft bill on communications just submitted by Francois Leotard to Jacques Chirac. According to this bill, A2 would be put up for auction first, then it would be FR3's turn.

There are 83 articles and 35 pages in the version that Francois Leotard, communications minister, laid on Jacques Chirac's desk in Matignon Hall. This "bill concerning freedom of communication", whose principal author is said to be Xavier Gouyou-Beauchamps, is nevertheless a working draft. It is not the definitive text soon to be submitted for a vote of the Assembly.

Jacques Chirac must now give the green light and the odds are very good that certain articles of the bill will be modified at Matignon.

It is the privatization of public services that will be the biggest headache for those called on to explain the final text. The method chosen by Francois Leotard consists of selling Antenne 2 first and splitting FR3 into two distinct companies: one company responsible for the national network would be made private and the other, made up of regional stations, would remain partially within the hands of the state. This choice, however, is not to the liking of Matignon, which has never disguised its preference: first make FR3 private, and the rest will be seen to later. Within the UDF itself, different voices are being raised. Valery Giscard d'Estaing has submitted his own bill proposal in which he projects the total privatization of TDF and SFP, in contrast to Mr Leotard's bill, which only converts the two companies into commercial companies with 51 percent state ownership.

As for the remainder, the Leotard bill is consistent with what the principal leaders of the current majority proposed before the elections: the creation of a new audiovisual authority and the maintenance of one public television station and one radio . . .

In addition to the section on privatization (highly interesting since it specifies for the first time the way in which it would be carried out), the last section devoted to temporary provisions provides us with some totally new information. The first thing one notices: Canal Plus comes through unscathed. Indeed, the bill projects that the VHF network "will be preserved and set aside as a paid television service", while article 79 emphasizes that "concessions granted before January 1, 1986 are terminated". It's goodbye then to Cinq and TV6 if this article makes it past the Constitutional Council. On the other hand, Canal Plus seems to have been spared.

Other projected provisions: personnel of companies whose capital is being relinquished by the state will conserve all of their rights; the High Authority will continue to preside until the arrival of its replacement; the non-private stations will continue to broadcast advertising for three years and, finally, station CEO's will be retained until the law is published. All that remains to be seen is what Matignon Hall will think of this version. We should have the answer in a few weeks.

#### Principal Articles of the Bill

##### 1.-- General Principles

Article One--Private communications and public communication activities are to be carried out freely.

Freedom of communication applies to the broadcasting, transmission and reception of signs, signals, written messages, images and sounds of all kinds, communicated by all existing or future means.

In accordance with equal treatment and the conditions defined by the present law, this freedom can only be limited to the extent required to insure territorial security, the maintenance of public order, respect for property and other rights and freedoms and by technical constraints, in particular, the scarcity of Hertzian frequencies.

##### 2.--The National Communications Commission

Article 4--A national communications commission responsible for guaranteeing the exercise of freedom as defined in Article one of the present law in the area of Hertzian and cable communications is instituted.

It insures equal treatment and encourages free competition and plurality in the sources and means of communication.

Article 5--The national communications commission is made up of seven members. The general assembly of the state council, the general assembly of the Superior Court and the advisory chamber of the Audit Office each elect one member chosen from among the state advisors, advisors and legal counselors respectively. The three members thus designated nominate three other members chosen for their competence in the area of communications. The six members thus designated nominate a seventh member.

### 3.--Use of the Hertzian Band

Article 16--Decisions relative to the different types of uses to which radio frequency bands are to be put are made by order of the prime minister after approval of the national communications commission. They are worked out according to a procedure involving the commission and subject to conditions set by decree.

Article 21--The national communications commission first assigns the frequencies necessary for the accomplishment of their public service mission to the national programming companies.

Article 22--Without prejudice to the provisions of article 66, the national communications commission allots frequencies to radio and television services broadcasting on the earth's Hertzian band according to the following conditions:

I. For geographical zones predetermined by the national communications commission, the commission will publish an invitation for applications to administer radio or television broadcasting services, along with notification of the applications closing date.

II. The statement, drawn up in accordance with a model decided on by the commission, will indicate the objectives and general characteristics of service, technical broadcasting characteristics, composition of capital, forecasted expenditures and revenues, and the source and amount of projected financing.

At the end of the time period specified in paragraph 1 of the present article, the commission will determine the list of applicants.

III. Based on the recorded statements, the commission will establish a map of available frequencies in the zone under consideration, along with information on broadcasting sites and apparent radiated power.

IV. The applicants on the list mentioned in paragraph 2 of the present article inform the commission of the frequency or frequencies on the map which they wish to use in broadcasting their service.

V. The commission designates the title-holders by evaluating the public value of each project, taking into account the party in question's experience in communications activities, the project's contribution to the development of competition and the plurality of views expressed.

Reasons behind refusals to authorize are provided and applicants are notified.

### 4.--Privatization

Article 42--The state is authorized to relinquish the capital property of the national television programming company called the Antenne 2 National Color Television Company to the private sector, subject to the following conditions:

1. maintenance of the company's program broadcasting zone on the date of publication of the present law and of existing modalities for making available company programs to the National Overseas Radio and Television Broadcasting Company, which will be replaced by the company mentioned in article 46 III;



2. the opportunity for company personnel to acquire a percentage of the capital stock at the time of the transfer;
3. continued state ownership of one percent of the company's capital, which will confer on it the right to oppose any substantial modification in the distribution of capital;
4. distribution of the company's capital such that no one person directly or indirectly holds more than 20 percent.

The functions of the president and board of directors of Antenne 2 Company terminate on the publication date of the present law. A general administrator, appointed by decree, will temporarily handle the administration and management of the company. He is given full power to act in the name of the company in all circumstances. He will cease to exercise his functions when a meeting of the general stockholder assembly, called after transfer of the company's capital, takes place. As soon as the present law is published, the government will have a consultative commission, whose composition will be set by decree, evaluate the transfer price of Antenne 2 Company. This evaluation will take into account the company's net assets and profitability outlook. Based on this published report, the government will set the minimum transfer price and communicate it to the national communications commission. The commission will establish the bidding file and compile applications according to conditions specified by decree.

The commission will select the beneficiary of the transfer and notify the government of its choice. The decision will be published in the Official Journal of the French Republic.

Beginning on the effective date of the state's transfer of capital, the commission will authorize the company to use the frequencies formerly reserved for Antenne 2 Company. This authorization is accompanied by the obligations specified in the second paragraph of article 20.

Article 43--I. The national television programming company called France Regions 3 is replaced by two national programming companies fully owned by the state, under conditions fixed by decree: one is devoted to the conception and programming of national public broadcasts; the other groups together a cluster of regional stations which conceive and program regional broadcasts.

The inheritance, rights and obligations of the FR3 Company are divided between these two companies according to their respective missions and following a procedure established by decree.

The right to use the frequencies formerly reserved for FR3 is granted to the two companies. The conditions under which the two share air time is determined by decree.

II. The state is authorized to relinquish the national programming company's property to the private sector according to the conditions and procedure established in article 42. Beginning with the creation of the company and until the date of its transfer to the private sector, it will be managed by a general administrator appointed by decree.

III. The composition and functioning of the board of directors of the regional stations company is regulated by the provisions of article 46 V.

The regional stations company is authorized to hand over to any private party, after prior administrative authorization, any part of its assets capable of independent operation.

Article 44--The national audiovisual company called the French Audiovisual Creation and Production Company is converted into a company subject to the common law applicable to limited companies.

Article 45--Telebroadcasting of France's public broadcasting establishment is converted to a fully state-owned company, under conditions determined by decree.

#### 5.--Temporary Provisions

Article 68--The national programming companies will continue to have use of the frequencies used by TDF to broadcast their programming on the publication date of the present law.

II. The VHF national network will be preserved and set aside as a paid television service.

III. A UHF network will be created and assigned to a national television service.

Article 70--In derogation of the provisions of article 50-II, the national programming companies will continue to enjoy access to revenue resulting from the broadcasting of commercial advertising within the limits of a ceiling set by the finances law, for a period not to exceed three years.

Article 77--The Audiovisual Communications High Authority specified in article 12 of the 1982 law will continue to preside legally until members of the national communications commission are installed.

Article 79--Concessions granted in application of article 79 of the July 29, 1982 law prior to January 1, 1986 are terminated. This will take effect on the date on which the new authorizations are handed down.

Article 80--Personnel required to be transferred among the different national programming companies, as well as those belonging to a company whose capital is relinquished by the state, conserve all rights specified in their work contracts.

9825

CSO: 5500/2686

FRANCE

## LESS PUBLIC FUNDING FOR ELECTRONICS SECTOR

Paris ZERO UN INFORMATIQUE in French 21 Apr 86 p 3

[Article by Philippe Moins: "Fewer Funds for the Electronics Sector"]

[Text] Gerard Longuet may consider himself satisfied. Since his arrival, the new state secretary of P&T [Postal Telecommunications Services] has set up a priority: to lighten the burden weighing down the P&T, which in 3 years has become a large supplier of public funds. The electronics sector, placed under the supervision of the DGT [General Directorate of Telecommunications], is the primary target. It has become an ever greedier child over the years, successively stripping from the P&T budget Fr 400 million in 1983, Fr 3.4 billion in 1984, and Fr 6.5 billion in 1985.

Now it is being put on a diet. The revised finance bill provides for a certain number of economies (Fr 10 billion) to be spread over different items such as research funds, large construction projects like the Bastille Opera, industrial policy funds, or even a salary freeze for public officials.

The contribution of the supplementary P&T budget to these cuts should amount to nearly Fr 500 million. These reductions will affect funds allocated to the Data Processing Agency [ADI], the DIELI [Directorate of the Electronics Industries and Data Processing], and the Research Fund. The latter, which should initially have been given Fr 210 million by the P&T, will ultimately receive only Fr 105 million. With ADI, Fr 80 million could be saved, thus depriving this institution of 40 percent of its revenues provided by the PTT [Post, Telephone, and Telegraph]. Finally, the DIELI will have to be satisfied with three-quarters of the grant initially anticipated, thus allowing additional savings of Fr 300 million. In total, incentive funds for distribution to companies will be down by Fr 485 million.

Capital grants to electronics enterprises remain unchanged. For 1986 they reach Fr 2.135 billion, 1 billion of which is for Bull. However, there is one reservation: The allocation over time of these grants can actually be modified, which will affect the funds of the benefiting industries.

Invited to last week's Suptelecom '86 forum organized by the National Higher Institute for Telecommunications, Gerard Longuet could not refrain from mounting his favorite hobby horse, i.e., the tax liability of the DGT.

"I want a common law tax structure for our activities," he declared, "so that we will no longer be a target for various predators. Since 1981, the DGT's surpluses have served far too often to finance an industrial policy like that of the electronics sector."

Seeking an end to the financing of the sector, the state secretary of the P&T wishes to eliminate the confusion between the management of public services and the mission of supervising [the sector]. "My first decision was to refocus the activities of the P&T administration on public services," he emphasized. "We have three assets: We have a commercial posture dating from the seventies which puts us in contact with the market, we are the most technologically innovative organization, and we enjoy the dynamic management of a monopoly."

/6091

CSO: 5500/A2697

ICELAND

TELECOMMUNICATION AGENCY INTRODUCES FIBER OPTIC PHONE CABLE

Reykjavik MORGUNBLADID in Icelandic 24 Apr 86 p 5

[Article: "The Post and Telegraph Administration Adopts New Technique: Fiber Optic Cables Replace Copper"]

[Text] The Post and Telegraph Administration has adopted a new technique. The first transmission on two small fiber optic cables took place between the Landsimahusid [Telegraph Administration Building] and the Mulahverfi [Reykjavik suburb] telephone station on Tuesday. The plan is to replace all the old copper cables between the stations this summer.

"This is the first system of many which we will install this year. We will also install this system from Reykjavik to Hvolsvollur this year. The transmission capacity of the fiber optic cables is considerable greater than that of the old copper cables. Two fiber optic cables can transmit 2,000 channels with the current equipment, but that can be increased to 8,000 channels with new equipment," said Jon Kr. Valdimarsson, department technician for the Post and Telegraph Administration. On the cable, which is shown in the accompanying picture [picture not included], it is possible to transmit on 24 thousand channels or 48 television channels. "It is also of great importance that it is possible to transmit messages to a distance of 60 kilometers but an amplifier is needed at a 1,500-2,000 meter intervals when transmitting on the old copper cables," said Valdimarsson.

9583

CSO: 5500/2677

ICELAND

AUTOMATED LONG-DISTANCE SYSTEM TO START OPERATING IN JUNE

Reykjavik MORGUNBLADID in Icelandic 15 May 86 p 3

[Article: "Automated Long-Distance Telecommunication System to Start Operating in June"]

[Text] "This is an automated state of the art system. It will be possible to dial any number here or abroad from the car and to dial from any number here or abroad directly to the car. This is like the telephone on our desk, a state of the art telephone," said Haraldur Sigurdsson, chief engineer for the Post and Telegraph Administration when he was asked about the new telecommunication system that will begin operating in June.

Sigurdsson said that in the beginning the system would be functional in certain areas and the objective is to have the system operating nationwide at the end of 1987. There will, however, be certain areas that cannot be included, such as the interior highlands in the center of the country.

This year, 31 main stations will be installed in various parts of the country. To begin with, these stations will mainly be installed in the Sudurland and Vesturland, but next year the net will be increased and the same number of main stations will be installed.

The users of car telephones in the country are now about 400 in all and all their calls are transmitted through stations with operator assistance. When asked, Sigurdsson said that these stations would not become obsolete with the opening of the automated system. They will continue to operate for an indefinite period.

9583

CSO: 5500/2677

ICELAND

BRIEFS

LONG-DISTANCE NET ADVANCES---It is reported in a news release from the Post and Telegraph Administration that the Administration has opened telecommunications with Denmark and Great Britain for users of the general data transfer network. The identification number of the Danish network is 2382, but there are two numbers in Britain, 2341 for the IPSS network and 2342 for the PSS network. The fee is 0.27 krona for initiating each call; each minute begun to Denmark costs 1.00 krona; to Britain 1.60 kronur and the quantity fee will be 1.00 krona to both countries for each initiated 10 data units. The aforementioned amounts include sales tax. The general data transfer network is expected to be linked with more countries in the near future. [Text] [Reykjavik MORGUNBLADID in Icelandic 14 May 86 p 17] 9583

CSO: 5500/2677

NORWAY

# ELEKTRISK BUREAU FIRM WINS LARGE TELEPHONE EXCHANGE ORDER

Oslo AFTENPOSTEN in Norwegian 6 Jun 86 p 36

[Article by Kjell Aaserud: "Big EB Orders for Telephone System"]

[Text] The Telecommunications Agency has entered into purchasing and leasing agreements with Elektrisk Bureau for telephone exchanges for slightly over 100 million kroner. EB reports that to begin with these will be digital AXE exchanges, which at one time competed with STK's [Standard Telephone and Cable Manufacturers'] for the major telephone exchange contract, but they will operate as analog exchanges in the Norwegian telephone system.

"The orders from EB are a result of the big increase in traffic accompanied by the delays in the System 12, which STK has begun to deliver," Telecommunications Directorate Information Chief Jarl Veggan says to AFTENPOSTEN. "That we have turned to EB is because the company knows the Norwegian telephone system and is able to help us in a difficult situation."

"But this does not mean that we will get two digital systems in the Norwegian telephone system. We are still convinced that the System 12 which we have ordered has come the farthest and for this reason it is the most advanced on the market. What we are waiting for is that it will function sufficiently well. The latest reports are to the effect that the exchange in Trondheim, which is in experimental operation, is now working as it should."

## Big Orders

EB has already delivered a smaller AXE exchange in Oslo. Before the new year the Frogner exchange, which burned down, will be replaced by a new 20-million-kroner AXE exchange. This will be purchased from EB. Exchanges for Oslo, besides, costing 48 million kroner, for Bergen, costing 14 million kroner, and for Stavanger, costing 21 million kroner, will be rented or leased.

"All these exchanges will function as analog exchanges in the system, because they have a so-called critical section which does not satisfy the Telecommunications Directorate," Jarl Veggan says. "The exchanges will be temporary, but can be used other places in the Norwegian telephone system where digitalization will come later. It is a different situation for the Frogner exchange. It can remain in place for a long time. If it is possible to



upgrade what we call the software so that it can be included in the digital system, then it can remain in place for a very long time."

#### Has Reserves

"We are of course very happy about the orders," EB Administrative Director Kjell Almskog says. "The delays and the increase in traffic have resulted in the fact that we have reserves. It has been my understanding that our exchanges can be upgraded to a digitalized telephone system. The happy thing for us is that EB, which formerly supplied 50 percent of the telephone exchanges in Norway, is still 'in the running.'"

There are a good two million telephone lines in Norway. A contract has been entered into with STK for the delivery of exchanges which will encompass 700,000 lines. According to Information Chief Jarl Veggan, option negotiations for the remaining exchanges have not begun. What is now being done with the purchasing and leasing of exchanges from EB is characterized by Veggan as reserve measures, but emphasizes at the same time that the Telecommunications Directorate is at liberty as to when negotiations regarding continued deliveries of the System 12 are to begin.

"I have no comment on this matter," EB's Kjell Almskog says. "L.M. Ericsson, which we are working together with, and EB are now in the process of developing far more advanced exchanges than those we had when the big contract was entered into. We have used a lot of money over a long time to further develop our own technology and competence and on building up a reserve. This is the reason that we can operate with very short delivery times. We are hoping that the time can come again when there will be need for our competence in the Norwegian telephone system."

8831

CSO: 5500/2688

SPAIN

GREATER GOVERNMENT CONTROL OF PRIVATE TV SOUGHT

Madrid EL PAIS in Spanish 11 Apr 86 p 17

[Article by J. Gonzalez Ibanez]

[Text] Madrid--Following discussions at the Ministry of Culture lasting more than an hour yesterday, representatives of Popular Coalition and the government voiced the possibility that the National Institute of Private Television, envisaged in the Regulation of Private Television bill, might be placed under parliamentary control.

Both Minister for Cultural Affairs Javier Solana, who spoke for the government, and Carlos Robles Piquer, general coordinator of Popular Alliance, agreed that it might well be possible to work out specific formulae to permit an agreement between the government and Popular Coalition on the bill, however Robles Piquer cautioned that his side conditions any final political and parliamentary consensus on the replacement of Jose Maria Calvino as Director General of Spanish Radiotelevision.

Representatives of the conservative opposition -- Carlos Robles Piquer (AP [Popular Alliance]), Jose Ignacio Wert (PDP [Popular Democratic Party]) and Gabriel Castro (PL [Liberal Party]) --laid before cultural affairs minister Javier Solana, and minister to the presidency Javier Moscoso, a number of proposals designed to reduce dependency on the government by the future National Institute of Private Television. Solana admitted to newspapermen at the end of the meeting that the government is prepared to accept some formula which will place the Institute under parliamentary control. The Institute is seen by the government as an autonomous body charged with advising the executive on allocation of channels, the rescission of such assignments, the imposition of sanctions and the working out of the national technical plan for television.

The Popular Coalition spokesmen and the government representatives also exchanged views on two other problem areas in the bill: the legal principles underlying the legislation, and the requirements for and the duration of government licenses. Robles Piquer, Jose Ignacio Wert and Gabriel Castro stated their preference for an arrangement which would leave the ownership of television service to the private sector, and not to the state and which would consequently establish a system of licenses rather than one of governmental

grants. The position of the government representatives was opposed to changing the bill in this area.

According to the Popular Coalition negotiators, Solana and Moscoso agreed to consider the possibility of extending the period of validity of private television channel licenses, which is at present set at 10 years. Likewise, they apparently agreed to the introduction of some corrections in aspects relating to enforcement measures affecting concessionaires.

After the meeting, Javier Solana stated his hope to "arrive at a sort of agreement in principle" with Popular Coalition. Carlos Robles Piquer, for his part, judged that the meeting had "made some progress". "We believe," he said, "that a formula is possible which will reconcile the differing criteria of both political groups".

Robles Piquer noted that both Solana and Moscoso had refused to tackle the question of an immediate formal dismissal of the director general of Spanish Radiotelevision.

12383

CSO: 5500/2647

SPAIN

THREE PRIVATE TELEVISION CHANNELS APPROVED

Madrid EL PAIS in Spanish 5 Apr 86 p 12

[Article by Juan G. Ibanez]

[Text] Madrid--The Council of Ministers approved yesterday the bill which authorizes and regulates, for the first time in Spain, the functioning of private television. The government has authorized the existence of three channels, which should broadcast both to Spain as a whole and to "each territorial or local zone--which can include more than one autonomous community--, which the national technical plan will define," to be elaborated by the National Institute of Private Television, created by the bill approved yesterday.

According to the bill, a minimum of 40 percent of the programs broadcast by the future private television channels should be self produced. Not more than 10 minutes per hour will be allotted for advertizing spots, and 50 percent of the films must be productions of Spain or of Common Market countries.

After parliamentary action on the bill, which may foreseeably be given urgent treatment, and once it has been published in the Official Bulletin of the State, the government will present a national technical plan and then immediately initiate public bidding, stating the conditions that the private companies seeking a permit for a channel must meet. The "preferible criteria" for the awarding of the concession will be "the technical and economic viability of each company's proposal, the national and territorial programming coverage, and the capacity to meet public demand," according to the government spokesman, Javier Solana.

After the press conference following the meeting of the Council of Ministers, Solana told EL PAIS that, in any case, the companies that apply for an administrative concession for television broadcasting should be current in their payments to Social Security. Solana stated publically that "the government hopes the concessions for the channels will be awarded before the next legislative elections, but this does not depend exclusively on the government."

The broadcasting authorizations, to be issued by the government, will be in effect for ten years and will be renewable successivly, without limit. Among

the causes provided by the bill for the suspension of the concession figures that of not having begun the broadcasts within the established time. Others of a general character include the suspension of payments, bankruptcy, or the loss of legal personality of the company, which must be configured as a joint-stock company.

#### Spanish And European Capital

The companies applying for a concession must have Spanish capital. Limits will not be placed on capital from countries of the European Economic Community since Spain did not sign any safeguard clause in this respect on signing the membership treaty, which allows free circulation of capital throughout the EC. The bill states that companies interested in obtaining a television channel are required by the government to broadcast a minimum of 4 hours each day of the week, with at least 40 percent of its programming being self produced. This second condition will not be required, however, starting from the first day of broadcasting, according to information supplied to this newspaper by government sources.

The broadcasting stations will have 3 years to attain the percentage of self production imposed--in a general way--by the government, which will permit in the meantime a gradual increase toward this goal. The bill would also require that 50 percent of the films broadcast by the private stations be of [word omitted: presumably "Spanish"] production, or produced in countries of the EC.

The bill, which in the version studied yesterday by the Council of Ministers, consists of 22 articles, establishes that the advertising broadcast by the private television channels is to be no greater than 10 percent of the weekly programming time, nor more than ten minutes during each hour of broadcasting. The maximum number of commercials allowed per hour will be 4. Spanish television advertising is limited to 8 minutes per hour broadcasted. However, it uses only about half the time allowed, or four minutes according to what Jose Maria Calvino, general director of RTVE, told this newspaper.

According to Javier Solana, the bill provides for the creation of a National Institute for private television "as an intermediary between the owners of the networks and the owners of the concessions." It will be an autonomous body charged with ensuring the smooth operation of the technical aspects of the private television broadcasting stations.

#### Territorial Broadcasts

This institute, which will be part of the Ministry of Transportation and whose members will be elected by the government, will consult with the executive branch and will draw up the National Technical Plan, which, among other characteristics, should define the territorial areas to which the regionalized broadcasts will be made. Said areas will not reproduce the map of autonomous Spanish communities but will group several of the communities together, according to government sources, who stressed the orographic difficulties of Spanish geography for the reception of television signals.

In any event, the technical plan is at an advanced stage, since "it has been necessary to prepare numerous technical studies to become certain that the functioning of 3 more television channels was possible, said government sources.

The bill approved yesterday by the government does not determine what the material format of the private television broadcasts must be, in an attempt to leave the doors open to the future utilization of fiber optics cable and a communications satellite, through the Telephone Company.

At this time the plan of the government is to "optimize" the ground network of Spanish Radio-television, which will require an investment of several billion pesetas.

Javier Solana declined to specify yesterday on the date which, in the opinion of the government, private television may begin to function, "considering that it is very difficult to estimate how quickly the cabinet will be able to deal with proceedings of a type with which it is unfamiliar. The National Institute for private television will also be responsible for setting the tariffs that the broadcasting stations must pay for the use of the transmission network, which is owned by the public.

In other action, the Council of Ministers appointed Javier Ruiz Castillo as director of the National Institute of Statistics.

[Boxed insert p 12]

[Article by J.G.I.]

[Text] Madrid--The bill regulating private television was approved yesterday by the Council of Ministers after a long elaboration, under the direction of the team of advisers to President Felipe Gonzalez and of vice president of the government, Alfonso Guerra. During its preparation, which has lasted nearly 7 months, experts from the ministries of Culture, the Presidency, and Transports and Communications have also participated.

One of the reasons cited by government sources to explain the delay in the approval of the bill--4 deadlines announced by the government spokesman, Javier Solana, have not been met--is the complexity of the topic, and particularly the need to draw on studies which would determine the technical possibilities of increasing the current number of channels.

In September 1985, major political figures in charge of the Presidency of the government had already announced approval for 3 private channels, but that did not obviate the need, according to the official version, for the preparation of various reports to determine their technical viability.

At present, the government relies on the ground network of Spanish Radio-television (RTVE) and the support of the network of the Telephone Company (CTNE).

According to a government source, in the future both the services of RTVE and those of CTNE, as well as those of a telecommunications satellite, could be used alternately and as may be required by each channel.

Along with the studies on the technical support for the signal transmission, another reason for the delay in the approval of the bill has been the decision as to whether or not to admit regional broadcasting.

Just 2 months ago, a high official--considered close to the vice president of the government--said that the governmental proposal would limit authorization to national broadcasts. Another high official stated to this newspaper at that time that the day after the decision on this matter was adopted the bill would go to the Council of Ministers.

12467

CSO: 5500/2640

SWEDEN

STATE TELECOMMUNICATIONS AGENCY LOSING PARTS OF MONOPOLY

Stockholm DAGENS NYHETER in Swedish 9 May 86 p 15

[Article: "Telecommunications Board's Monopoly Adjusted"]

[Text] The Telecommunications Board could lose yet another aspect of its monopoly. This includes the testing and approval of telephones and the granting of permits for mobile telephones and radio transmitters.

A government study is examining the agency's authority in the areas of permits and approval. The result could be that a new government agency, independent of the Telecommunications Board, would be formed to take over these tasks, TT (TIDNINGARNAS TELEGRAMBYRA) was told by the Communications Ministry.

The agency has already lost its monopoly on telephones.

The government appointed the study committee in September of last year. The government thought it looked bad for the Telecommunications Board to sell the same products as its competitors while, at the same time, the agency could prevent its competitors' products from coming out on the market.

9336  
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18 July 1986

SWEDEN

## BRIEFS

OMAN, NORWAY ERICSSON ORDERS--Ericsson has received an order from Oman for further expanding that country's telephone network. Ericsson has previously built Oman's telecommunications network and installed AXE phone exchanges valued at one half billion kronor. Ericsson has also received an order from Norway for digital AXE exchanges valued at 90 million kronor. This is the first AXE order for the Norwegian Telecommunications Agency. [Text] [Stockholm DAGENS NYHETER in Swedish 20 Jun 86 p 10] /8309

CSO: 5500/2696

TURKEY

# GOVERNMENT POLICY ON TRT'S IMPARTIALITY QUESTIONED

Istanbul TERCUMAN in Turkish 29 Apr 86 p 11

["Your Decision" column by Mukbil Ozyoruk: "The TRT Is Fully Immersed in Politics"]

[Text] The defense of a special provision included in the new law on TRT [Turkish Radio and TV Administration] with regard to a government broadcast called "From Inside the Executive" was based, as always, on the principle of "TRT's impartiality." It was said: "TRT is only on the side of the state. It does not and cannot support any political party, group or alignment. The only criteria used in the broadcast of its news is that of 'newsworthiness.' But governments have activities which cannot be reported in the form of news. There will be government programs which can achieve success through the participation of the people. Such programs must be explained and promoted to the people so that they can endorse them. For this reason, the government must be able to have a broadcast of its own which will not exceed 30 minutes a month, provided that the TRT's broadcast principles are adhered to and no political interests are pursued."

Some concerns were raised with respect to this provision. There was anxiety that the "half hour a month" allocated to the government could violate laws, that it could have a "political motive" content through the use of certain metaphors and that it could even be used "exclusively for political motives."

Not surprisingly, what was feared "was immediately realized in practice." We could perhaps force ourselves to say that in the first one or two "From Inside the Executive" programs "the political interest motive" was not obvious. However, none of the programs that followed would win the verdict of "does not contain political interest motives" from an "impartial" jury.

The TRT's "Main News Bulletin" on television appears to be organized so that it follows a virtual "printed sequence." One must agree that the government's expertise in "advertising" is spotless. The Prime Minister has been extremely punctual in appearing on television every day without exception. For the last 2 1/2 years the main news bulletins on television have followed the "same unchanging sequence every evening without exception," unless there is a news item about the President on a given day:

First, "Prime Minister Ozal"; then the "ministers"; then high public officials; and then, if there is any time left, "the real news."

In the last 2 1/2 years have you seen a single news bulletin that did not begin with "Prime Minister Ozal"? Even the "brief" broadcasts of statements by political parties represented in the Assembly was begun only very recently, and that only after heated arguments.

"Political advertising" on the screen has now assumed the form of a more intensified and widespread "principal activity."

The Prime Minister has begun "exclusively political" touring programs as if there was a general election to be held soon or as if "electioneering has begun." Moreover, these tours are not aimed at simply promoting the government party.

How else can one interpret Ozal's latest "Isparta demonstrations"?

Let us be clear: Even at times of worst complaints, the TRT was not involved in domestic politics as deeply as it is now.

Thus, the "From Inside the Executive" program is being broadcast "to comply with customs"; this tool provided by Article 19 of the law is being used so that it does not get "eroded by time." In fact, standing next to the nightly main news bulletin on television, the "From Inside the Executive" program is a virtual godsend from a standpoint of "political interest motives."

The TRT is in a state of "full engagement" with the government in a manner which no one can ignore.

On the basis of the lessons we have learned from all of our political experiences since 1946, let us remind all those who were young enough to play with hoops and marbles during those most intense and heated years of our political life:

This course will once again (for the umpteenth time) make the TRT the country's number one problem, and some reckoning will certainly and definitely be required.

9588

CSO: 5500/2675

TURKEY

FINNISH FIRM SIGNS CONTRACT TO BUILD MOBILE PHONE NETWORK

Helsinki HUFVUDSTADSBLADET in Swedish 30 Apr 86 p 14

[Article: "Mobira Phones to Turkey"]

[Text] Mobira Oy, part of the Nokia Concern, and the Turkish Postal and Telecommunications Board have signed an agreement for the construction of a mobile telephone system in Turkey based on the NMT (Nordic Mobile Telephone) system. The contract is for a sum of 53 million markkas. As a result of the agreement, Mobira has received its first order for a complete mobile telephone system. Thus, Mobira has taken a giant step toward its goal--capturing extensive orders on the world market.

The contract, which Mobira won in stiff international competition, includes construction of the first phase of a mobile telephone system that will be delivered in turnkey condition to greater Ankara and Istanbul. Later the capacity of the network will be expanded to include certain other cities in Turkey, as well as the main highways between them.

The system is based on the NMT system, which was developed by the Nordic countries. In addition to the Nordic countries, the system is used in many European countries, in the Middle East, and in Southeast Asia.

The mobile telephone system for Turkey will consist of automatic exchanges, base stations with several channels, telephone connections among exchanges, and customer equipment that is portable or installed in automobiles. The agreement also includes systems planning for radio technology and the implementation of extensive technological projects in Turkey.

9336  
CSO: 5500/2681

**TURKEY**

**BRIEFS**

**RADIO-TELEX SYSTEM--**The Anatolian Press Union seventh session general council meeting was held yesterday in Ankara. Minister of State and government spokesman Mesut Yilmaz reported at the general council meeting that a 590-million-lira project being undertaken within the structure of the Press and Publications Directorate General will include a radio-telex system that will provide a flow of daily news from Ankara to governors. News reports will be duplicated by governors' offices and distributed to the local press. Yilmaz added that the Press and Publications Directorate General and the Anatolian News Agency are working to become established quickly in Anatolia. [Excerpt] [Istanbul TERCUMAN in Turkish 4 May 86 p 3] 11673

CSO: 5500/2679

END